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ABSTRACT

In an effort to bring entering allied health students to college-level reading ability, a Science Reading Program based on the theory that adult learners will be more motivated to improve reading skills if material is related to career preparation was designed, implemented, and evaluated. After pre-testing on the Nelson-Denny Reading Test (Form A), 100 nursing and dental hygiene students were divided into program Levels I, II, and III according to reading levels 7-9, 10-12, and above 12, respectively. Subjects participated in two introductory group sessions followed by individualized, programmed instruction involving the use of a mechanical Reading Accelerator for a period of one semester. Reading instruction utilized science related materials. Active participation resulted in reading gains at all levels, with Level II moving from grade 11.6 to 12.2 on the Nelson-Denny post-test. Instructional components and implementation procedures for the Science Reading Program are included, and samples of instructional materials are appended. (RT)

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THE DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF AN INNOVATIVE SCIENCE READING PROGRAM FOR USE IN THE COMMUNITY COLLEGE

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by

LORRAINE BEITLER

A MAJOR APPLIED RESEARCH PROJECT PRESENTED IN
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ABSTRACT

This study involved the design, development and evaluation of a Science Reading Program for the Division of Allied Health at New York City Community College. Included is evidence that has been documented indicating the need from internal and external sources for a program to develop college reading abilities for science students.

Procedures were formalized for the implementation of the Science Reading Program on an experimental basis for 100 freshman Dental Hygiene and Nursing students at New York City Community College.

High school records and performance on standardized tests indicated that many freshmen admitted to the Allied Health programs at City University of New York have not acquired the prerequisite reading skills necessary for successful performance in college science curricula. Students enrolled in Allied Health career programs need to be prepared to meet a rigorous two-year curriculum. Reading competency on the college level must be acquired in order to maximize learning in the classroom, laboratory, and clinical environments. After the completion of the two-year curriculum, students are expected to perform at a level such that they can successfully compete with peers who have completed similar programs at four-year colleges, hospital-affiliated teaching institutions and other two-year colleges. Two-year degree programs culminate in local, state or federal licensure and/or certification examinations which

require evidence of knowledge and application of content in specific careers. A facility in reading skills is a factor that appears to be related to successful performance on these examinations. Questions have been raised as to the types of instructional programs most effective to develop the reading skills of those students who desire to pursue college work. A Science Reading Program utilizing "career-related" reading selections was developed. The assumption was that students utilizing materials drawn from textbooks and professional journals related to their chosen careers will achieve mean reading gains in comprehension and rate.

The Science Reading Program, developed by the investigator, focused on the immediate goals of preparing the students for a career which they had chosen. There are three interactive factors central to this program: motivation, through the use of career-related materials, mastery-level requirement of 70% comprehension, reading rate improvement, utilizing a mechanical device. These three were conceived to undergird strong, positive learning behaviors for students who previously lacked academic success or who have not achieved their potential.

In the fall, these newly admitted one hundred Nursing and Dental Hygiene freshmen students were enrolled in the experimental Science Reading Program. The Nelson-Denny Reading Test, Form A and the Facts or Myths Inventory were administered to those students during the first week of the academic term prior to instruction. Based on the reading test, students were classified into three reading ability groups: Level I (7-9th grade reading ability), Level II (10-12th grade reading ability), and Level III (above 12th grade reading ability).

Classes were scheduled for the 15 weeks of the term. The students were encouraged to attend the Open Laboratory, from 9:00 to 5:00, to use the prepared materials of the Science Reading Program with a reading accelerator for some of the passages.

The exercises and the reading rate settings for the accelerator were designated by the Open Laboratory instructor. A Student Progress Sheet and Graph, accurately filled out, provided continuous data on the student's improvement and needs. Following each exercise, the student was responsible for recording the number of the passage read, and the answers to the comprehension questions. With the instructor, the student scored the answers and graphed the comprehension level obtained. The instructor then prescribed the next passage and rate for the student, or directed the student to follow-up skill development exercises.

During the last week of the term, The Nelson-Denny Reading Test, Form B, was administered to all students. Comparisons of the scores on pre- and post-tests (Forms A and B of The Nelson-Denny Reading Test) provided a basis for evaluating the impact of the program on students.

An analysis of the data for this study indicated that:

1. active participation in the program resulted in significant mean reading gain for students in Levels I, II, and III.

2. of all active participants, those who read between reading grade levels ten and twelve made the most significant mean reading gain.

3. there was a significant relationship between the number of passages read and the mean reading gain for those participants who initially read between grade levels seven and nine. However, for those students who read initially at above tenth grade reading level, there was no significant relationship between mean reading gain and the number of passages read.

4. students who had scored at the highest reading level possessed the most information regarding reading skills as evidenced by results.

It may be concluded that a structured, high interest, reading program can produce a significant result in one semester among Allied Health community college freshmen. The results suggest that creating an environment conducive to learning that incorporates learning theories relative to adult students, does result in significant gains.

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Chapter I

INTRODUCTION

STATEMENT OF PROBLEM

Difficult as the educational process is, this difficulty is intensely aggravated by extreme heterogeneity of the diverse proficiency in basic skills possessed by entering students. High school records and performance on standardized tests indicate that many freshmen admitted to Allied Health programs at New York City Community College have not acquired the prerequisite reading skills necessary for successful performance in college science curricula and state licensure examinations. Questions have been raised as to the types of instructional programs most effective in developing the reading skill of students who desire to pursue college work. The problem is to determine the effectiveness of comprehensive reading programs in order to increase the probability of academic success of students in the Division of Allied Health by reducing the teaching/learning difficulties of a population with wide variation of student skills. This program attempted to meet the needs of depressed ability students with relevance to major field curricula.

The study involves the design, implementation, and evaluation of a science reading program based on innovative materials at three levels of reading difficulty. A Science

Reading Program utilizing "career-related" reading selections was developed. The assumption was that students' reading materials culled from textbooks and professional journals related to their chosen careers will achieve reading gains because of the "interest" factor. A statistical evaluation was used to measure the effectiveness of the program for 100 students in the Division of Allied Health at New York City Community College.

BACKGROUND OF THE STUDY

With its commitment to Open Admissions, the City University of New York placed higher education within the grasp of all New York City high school graduates. This commitment carried with it a major challenge for the socialization of significant numbers of educationally disadvantaged students into a higher education system that presumes every student will come to college with certain basic educational skills (Barzun, 1972).

The academic history of many students entering New York City Community College (N.Y.C.C.C.) is often characterized by low achievement scores due to severe deficiencies in their academic backgrounds (Alfred, 1975:43). Often the level of academic preparation falls far below the minimum level necessary for successful completion of a career educational program. Students enrolled in the career programs, such as the Allied Health and Natural Science fields, need to be prepared to meet a rigorous two-year curriculum. Skills need to be developed in order that learning may be enhanced through lecture, laboratory, and clinical experiences. After the completion of the two-year curriculum, students are expected to perform at a level such that they can successfully compete with peers who have completed similar programs at four-year colleges, hospital-affiliated teaching institutions, and other two-year colleges. Two-year degree programs culminate in local, state and federal licensure, and/or certification examinations which require evidence of knowledge and application of content in specific careers (Purtillo, 1973). A facility in reading skills is a factor that appears to be related to successful performance on these examinations. Combined with evidence of high attrition and traditional faculty attitudes toward instruction, the process of successfully completing a technical curriculum and acquiring certification or licensure is an overwhelming task for many students (Levin, 1974).

Many reading programs have been geared to the continued use of irrelevant and unrelated reading exercises which largely ignore the career interests of students' reading materials in their chosen field. Students have expressed frustration with "low-interest" materials utilized in these general reading programs and perceive no relationship to their goals. Responsibility is placed solely on the student to transfer reading skills in these general areas to specific career curricula, but often the motivation for such transfer is lacking.

This program will focus on the development of basic reading skills in the Allied Health professions through application of innovative techniques to science materials. The objectives of this Science Reading Program are congruent with the goals and objectives of the college, stated in the New York City Community College Informational Bulletin (1975) as follows:

1. To provide a range of services for underprepared students to help overcome their educational deficiencies and thus increase probability of success in their curriculum program.
2. To provide programs of education to permit students to function as contributing members of the society as well as to progress both in their chosen work and in their formal education.
3. To provide formal and informal opportunities for those who endeavor to meet changing personal and career objectives.

DOCUMENTATION OF NEEDS

The Science-Reading Program was developed to help prepare students for the successful completion of career programs in the Division of Allied Health and Licensure examinations. The program is designed to especially assist students from disadvantaged backgrounds who are often poorly equipped for the academic scene, but enter our programs hoping to acquire training that will enable them to compete successfully in the job market.

In a study conducted under the auspicies of the Carnegie Commission on Higher Education (1970), the following was cited:

> The most serious shortages of professional personnel in any major occupational group in the United States are in the health services. Thus, one of the greatest challenges to higher education in the 1970's is to mobilize its resources to meet the need for expanding the education of professional health manpower. To accomplish this task, ... schools will need greatly augmented public financial support, but they will also need to give sustained attention to restructuring their educational and service programs to meet the nation's need for a more adequate system of delivery of health care.

Challenor and Jones (1972) of The Urban Center at Columbia University further substantiate the need for training Allied Health Personnel:

> Considerably larger numbers of health professionals, including doctors, dentists, nurses, skilled technicians, and other allied health personnel will be urgently needed to provide full health services to all, including urban and rural underprivileged populations. Massive federal support to defray costs and minimize economic barriers to health and health science education will be mandatory if sufficient personnel adequate in numbers and competence are to be trained. Both schools and students will have to be subsidized. Additionally, new health careers and job roles will have to be created, allowing new types of skilled and well-trained health professionals to assume many of the duties which, traditionally, have been reserved for the physician.

A grant proposal for consideration by Health, Education and Welfare was written by the investigator and submitted under the sponsorship of New York City Community College. A grant was received which provided for an Allied Health Professional Learning Skills Program to be supported in tandem with funding from the college budget. One of the components included the implementation of the Science Reading Program for students in the Division of Allied Health. See Appendix A for official notice of grant award.

For the academic year 1975, procedures were formalized for putting into practice, on an experimental basis, the reading program. All participating students were scheduled each week for 2 hours, in an open laboratory facility, to use modularized units on a prescriptive basis. Weekly attendance in the open laboratory followed 2 hours of classroom instruction. A directive from the Dean of Faculty to the chairperson of the Curriculum Committee of New York City Community College charged this committee with the responsibility of serving as a liaison for this experimental program with the Faculty Council of the college. See Appendix B. Based on their recommendations, this course may become a continued course offering at the college and serve as a model for other career-oriented reading programs.

The need for an innovative approach in reading on the community college level has been recognized by the administrators at New York City Community College and educators on a national level. This is evidenced by letters written by representatives of administration and faculty of New York City Community College. See Appendix C. These letters indicate support for the need to investigate the problem of developing a reading program responsive to the educational need of two-year urban college students in order to provide them with the basic skills necessary to extend their educational progress.

HYPOTHESES

It was relevant to develop hypotheses into related empirical references as they applied to the problem of this investigation. Students were classified according to reading scores as measured by The Nelson-Denny Reading Test into 3 Reading Levels I, II, and III. It is important to test for differences between and among groups with regard to improvement in mean reading gains of students who participated in the Science Reading Program. Therefore, the working hypothesis as they related to this investigation are stated as follows:

H_1: It is expected that there will be no significant difference between the mean gain in reading scores on the pre and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Active in Reading Levels I, II, and III.

H_2: It is expected that there will be no significant difference between the mean gain in reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Active.

H_3: It is expected that no significant difference exists between the mean gain in reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Inactive in Reading Levels I, II, and III.

H_4: It is expected that there will be no significant difference between the means of reading scores on the pre- and post-test as measured by the Nelson-Denny Instrument for the combined data across all Reading Levels I, II, and III separately classified as Active and Inactive.

H_5: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for all Active subjects separately classified by Reading Levels I, II, and III.

H_6: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for all Active subjcts as a combined group across all Reading Levels I, II, and III.

H_7: There will be no significant difference between Active students classified in Reading Levels I, II, and III with regard to perceptions of Facts is Myths Inventory.

DEFINITION OF TERMS

Various terms referred to in the text of this study must be defined in order to develop common references regarding their usage.

Open Admission Policy requires that students meet 3 requirements for admission to the City University of New York: a high school diploma or its equivalent, residence in New York City, and good health.

Nelson-Denny Reading Test (Revised Edition) is a standardized test composed of a 10-minute, 100-item vocabulary section and a 20-minute, 36-item reading comprehension section. Both parts use multiple choice type responses. The two alternate forms A and B were used as a pre- and post-instrument in an attempt to measure mean reading gain.

Reading Grade Level was determined by the McLaughlin (1969) "SMOG" formula. It is based on sentence length and syllable count and is a procedure used to assign an approximate level of difficulty to the reading materials. See Appendix D.

Science Reading Passages utilized in the program were one topic reading passages of approximately 400-600 words in length taken from medical or science textbooks and professional journals.

Ten Comprehensive Questions followed each Science Reading Passage. These were used to test the students' mastery of the wide range of reading skills. The questions tested factual recall, drawing conclusions, literal and inferential vocabulary, and the ability to infer the main idea.

The Active Group was made up of those students participating in the program who read 6 or more Science Reading Passages. This was the experimental group.

The Inactive Group was made up of those students enrolled in the program who read less than 6 Science Reading Passages. This was the control group.

Reading Rate, as used in this study, is the time in words per minute needed for completion of the reading passage and the responses to the 10 comprehension questions.

LIMITATIONS AND ASSUMPTIONS OF THE STUDY

1. The study was limited to students who enrolled in New York City Community College for their first semester of study in the Division of Allied Health.
2. There was no provision made in this study to analyze the data according to classification variables such as sex, age, military service, or number of hours working outside of the college.
3. The study did not take into consideration overall success as measured by scholastic index or attrition rates.
4. Although the academic experience of students varied with the curriculum and standards of their secondary schools, there is no provision to examine the effect of the college educational experiences.

It was an operational assumption of the study that a standardized reading test based on national norms was an adequate tool for measuring reading progress of New York City Community College students enrolled in the Division of Allied Health. Furthermore, it was assumed that students participating in the program will be able to complete a prescribed number of reading passages and that standard teaching methods outlined in the procedures of the innovative Science Reading Program be implemented. Finally, it was assumed that the sample population participating in the program was not different in any significant respect from a sample of urban community college students chosen from a true random selection.

Chapter II

RELATED LITERATURE

The focus of American education on post-secondary levels has changed from an elitist to an egalitarian point of view. Access to higher education has been expanded, particularly at the community college level. This trend is likely to continue as college admission policies are liberalized in response to the needs of new students. Restrictive college admission policies have been replaced by new open admission criteria.

During the last decade various programs have developed and continue to be developed to assist college students who are educationally disadvantaged. For the most part, these programs are found in community colleges across the nation, with New York City and California community college systems the most committed in terms of personnel, facilities, and financial resources (Gordon, 1965).

The open door concept is not unique to the United States. Mount Royal College, a two-year community college in Calgary, Alberta, Canada, pursues an open door admissions policy and admits any person in the community who is over 18 years regardless of educational background. Their school population is also characterized by diversity in age as well as student interest and ability (Rose, Demicelle and Chase, 1970).

The change in composition of this "new" clientele has had considerable impact on faculty and students. It has mandated changes in traditional reading programs to include: alternate instructional formats, flexible scheduling, adaptation of learning strategies for the adult learner, and a systems approach to support a viable college reading program (Beitler, 1972).

However, the presence on campuses of large numbers of students who are educationally disadvantaged has raised many questions. A review of the literature was initially directed to examine current theories of learning in relation to the adult student. This source included the following factors: relevancy as a motivation for learning, the nature of learning difficulties, and characteristics of the educationally disadvantaged.

THEORIES OF LEARNING AND THE ADULT STUDENT

Relevancy as Motivation for Learning

The appeal to interest as the cornerstone on which to build a program was stated most forcefully by Spiegler (1964). The problem was that materials slow learners have been asked to read in the classroom had not appealed to them and was not directly related to their lives here and now. Dutton (1964) supported Spiegler's emphasis on interests and, joined the many who stressed more immediate relevant reading selections.

Ten years later, this concept was still receiving support. Bachner (1974) stated again that curriculum and materials designed basically for college prepartory must relate to the academic interests of the school population.

Blair (1965) asserted that the practice of stereotyping students in one group without identifying potentially competent, disadvantaged students needed to be overcome in order to provide supportive programs on a prescriptive basis. This would assist the education of the deprived student at the post-secondary level.

Havighurst (1970), an environmentalist, indicated that varying socio-economic groups should consider different rewards for their children as motivation for learning. Disadvantaged and minority students reacted most favorably when gains in learning were linked with material acquisitions.

Lehman College (Cash, 1973), a unit of the City University of New York, offered a course in reading and study skills to its undergraduates. In order to encourage application of these skills to the students' content area courses, material directly related to their actual academic experience was needed. The reading and study skills staff and the departments of history and biology developed material focusing on the aspects of textbook reading, note-taking, lecture note-taking (which emphasized the relationship between text assignments and lectures), and an examination component to include techniques of test taking, studying, and planning examination time efficiently. A majority of the students indicated a greater facility in reading, analyzing, and remembering information from their text assignments; improvement in taking notes from their lectures; and improved ability to use efficient examination-taking techniques. Students also became more aware of the relationship between text assignment, lecture, and examination. He further hypothesized that disadvantaged students were not significantly different learners than advantaged students and it was his belief that the proper emotional environment was the key to successful learning and achievement. Many students have not been functioning in the main stream of academia as early as third or fourth grade because of failure to measure up to the mean achievement of the group. Making higher education available to these students must include the opportunity to acquire the necessary academic preparation, and institutions must attempt to offer learning experiences which will fill these voids.

The Nature of Learning Disabilities

McAllister (1972) endorsed the viewpoint that students can learn if they are properly challenged, motivated, and supported. Poor reading skills were likely to be accompanied by learning disabilities which compounded the problem for compensatory programs. He investigated the correlation between deficiencies in the sensory areas with little or no gain in reading skills for some students. Using the scores of The Nelson-Denny Reading Test and the results of an eye movement test on the Reading Eye II Keystone Telebinocular, there was a significant correlation between poor performance on The Nelson-Denny Reading Test and inefficient eye movements. He indicated that these students often exhibit such common symptoms as: confusion of direction, poor perceptional-motor coordination, awkward body motions, poor handwriting, and confusion in identification of similar sounds. They had difficulty in following lengthy directions or detailed lectures. McAllister concluded that there was a large number of students in attendance at college today with these learning problems and constructive programming must be effected by educators who are aware of these factors.

In addition to sensory factors that mitigate learning there were socio-economic, educational, and psychological factors. Based on observations at the University of Illinois, Boney (1964) suggested that educationally disadvantaged students have experienced rejection and hostility in their home environments. This attitude was projected into the school environment and acted as a deterent in learning situations. These students lacked the confidence to ask questions, to disagree, and to ask for clarification by their teachers because of the psychological discomfort involved. Many acquired minimum passing grades by performance based on memory. These students frequently lack the understanding of total concepts and learning voids were glossed over resulting in superficial learning. As a group, they tended to perform poorly on standardized tests which were designed to measure ability to detect analogies and contrasts, define vocabulary, draw conclusions, and make inferences.

Resnick and Kaplan (1971) examined the SEEK (Search, Education, Equality, Knowledge) program at Queens College and found certain common learning difficulties in a majority of the students. Their writing was disorganized and was often marred by severe flaws of sentence structure, run-on sentences, sentence fragments, and agreement errors. Related to this lack of logic in writing were difficulties in reading. Students could not identify the essential idea of a reading passage and tended to confuse and group abstraction with supporting detail. They also lacked such technical skills as note-taking and listening effectively. He noted that students who were deficient in the most basic skills of writing and reading were often quite articulate verbally when dealing with concrete topics.

Characteristics of The Educationally Disadvantaged

Froe (1964) asserted that as a group, the disadvantaged college youth exhibited certain general characteristics such as: parents with minimum educational achievement, minimum occupational success, and minimum socio-economic status.

Deutsch (1970) characterized the disadvantaged student as having a family history of social inequality, a minimum of direct contacts with other strata of our culture, and absence of successful adult male figures to serve as models. This group of students often lacked a language facility needed to emphasize concepts and their relationships. The classroom was viewed as being an isolated situation since the home environment did not reinforce learning.

Veldman (1968) stated that there was a need to utilize desensitization techniques in order to reduce anxiety before learning can be facilitated. However, for these changes to be effective, additional attention had to be given to ending the complex behavior patterns of underachievers.

Maxwell (1971) characterized the underachiever as one who lacked clear delineation of goals, had a poor self-image, and was anxious about failure-producing situations. Blair (1964) observed that the price of academic success for some of the disadvantaged students was disassociation from his normal environment which included withdrawal from his parents, peers, and culture. Williams (1969) commented that the disadvantaged students inherently distrusted authority. Their personal, economic, and racial problems interfered with the time required for academics. In his investigation of the many factors of personality that correlated with academic achievement, Berralta (1970) ascertained that a positive self image was the factor which correlated most highly within the mastery of learning skills. He concluded that a structure must be provided that is highly personal, support attitudinal changes, and encourage the students' belief that they can achieve.

O'Banion (1971) asserted that the environment of community colleges must be more humanized if they are to be institutions of learning. By implementing alternate instructional formats, learning can be facilitated by moving away from a man-production model to the lock-step 50-minute class with a required curriculum written in a fixed semester time constraint.

Schaffer (1973) 'at the San Fernando Valley State College assessed the enrollment status of 80 students at the start of the third year. He examined the relationship between the number of college credits earned with certain personality attributes. The author recorded that 35 students had earned approximately 50 credits and were in a position to continue their studies. These successful students were noted to be highly motivated with well-directed educational goals.

Within the parameters of the theories of learning cited previously, a comprehensive search of literature was directed to include a review of the following relevant topics:

1. The need for college reading programs,
2. Investigation of varying factors to include:

  a. rate and comprehension,
  b. flexibility of reading rate,
  c. use of mechanical devices to improve reading rate,
  d. reading rate gains and retention, and

3. Survey of college reading programs.

THE NEED FOR COLLEGE READING PROGRAMS

In September 1970, a policy of Open Admissions was adopted by the Board of Higher Education of the City of New York which mandated that all high school graduates, regardless of academic achievement, were guaranteed a place at one of the 18 units comprising the City University of New York. Chancellor Scribner (1973) stipulated, effective June 1974, that a high school diploma in New York City would be awarded for satisfactory achievement of 36 credits as demonstrated by a passing grade for each subject of 65 percent and an eighth grade reading level as demonstrated by a standardized reading test. This has resulted in a large influx of students from vocational, technical, non-academic, and even academic high schools who are now entering college without adequate preparation in the area of general education at the City University of New York.

Harrington (1975) stated the concept of Open Admissions at the City University of New York, "does not mean that every student must be admitted to the campus of his or her choice." All graduating high school students completed a form specifying the colleges they preferred. The assignments were then made in relation to the student's high school grade average or ranking in class, (whichever is higher). But if City University of New York applicants were assigned to these campuses exclusively on the basis of high school average or ranking in class, the result would be semisegregated schools. Placement at a college through computer input involves factors of social class, race, and grade average, which is often a consequence of social structure, not of native intelligence.

There can be no doubt that Open Admissions has tremendous consequences for the youth of the economically disadvantaged citizens. A student selecting an open admission college has certain expectations. The student perceives this as a fresh opportunity to succeed in an academic environment for which he might not otherwise have qualified. In the same vein, the open admission institution accepts the challenge to salvage these human resources through the educational process (Roucch, 1968).

However, the students often present themselves at the doors of post-secondary education with limited tools for acquiring knowledge. Gordon (1970) illustrated one measure of the changed profile of these freshmen by citing scholastic aptitude test scores of students now admitted to college. They ranged from the low 250's to the high 700's which was a far-wider spread than previously existed.

Durkee (1972), recognized that reading skills were not being perfected in the secondary school, and as a result, colleges felt an obligation to take students at the level of skill and maturity they acquired at admission and develop programs of education at that level.

> As the college increasingly becomes the college of all the people...the need to diagnose difficulties in reading and to offer a constructive program to deal with them seems to be inescapable.

In fact some students suffered from deficiencies so serious as to make many college courses less immediately useful to them than would be the case if students participated in corrective reading programs (Peck and Brinkley, 1970).

Muehl (1972), investigating the concept that many entering college students are insecure because they read so much below expected standards of comprehension, advocated a comprehensive reading program. From freshman year on, the split between different disciplines tended to increase with specialization in content curricula and served to widen the gaps between achievement, lack of basic reading and study skills. College freshmen, especially educationally disadvantaged students, identified their own skill deficiencies as their greatest academic problem. They internalized blame for their academic difficulties and were anxious and concerned about their academic achievement (Maxwell, 1971). This was substantiated by data obtained by DiSalvi (1971) which indicated that a large number of college freshmen felt a need to improve their study habits and reading skills and were willing to voluntarily participate in a remedial program to meet these needs. However, in a study he conducted, statistical analysis revealed that there were no significant differences between those participating in a reading program after 6 months and the control group with respect to grade point average.

Roueche (1968), declared that data available pertaining to the outcome of student experiences fail to affirmatively support the effect of participation in college reading programs. Reporting the results of a California state survey of 270,000 freshmen who entered public junior colleges in the Fall of 1966, he found that 70 percent of these students failed the qualifying examination for English 1A, the basic college English course. Only 20 percent of the student population enrolled in remedial English and later matriculated into standard college English classes. These attrition statistics imply that current remedial programs may be of questionable value in overcoming learning problems.

In contrast, Evans and Dubois (1972) support the premise that the primary response of community/junior colleges to the problems of the low achiever was some form of remedial program. While the specific objectives of the various remedial courses varied widely, the fundamental purpose was to prepare the low achieving student for participation in a regular course of study. The authors, however, identified a second category of underachievers with which the community/junior colleges must deal; those who, despite average or above average intelligence, have not developed adequate academic skills, especially basic reading and study skills. These students, too, exhibited difficulty in understanding, organizing, and internalizing written materials at the college level. Deficiencies in reading and thinking skills were common and, as a result of low scores on standardized reading and English tests, both types of low achievers were generally assigned and benefited from both remedial and developmental instruction of reading and study skills. He contended that a reading program can offer valuable services to the average and the above average college student. Bright students have not always developed to the fullest potential their basic competency skills. Students mature as they progress through college study and their rate of reading can be increased without impairing their comprehension skills. Colvin (1971) asserted that there was an underlying belief that ... "every college student can and should improve his reading and study skills to his optimal level." College reading and study involve complex skills which may be developed through instruction and practice, in much the same way that other communication skills are improved.

Bachner (1974) pointed out that if an economically deprived student learns to read with comprehension and enthusiasm, this limits his "disadvantaged" condition to socio-economic status and no more. On the other hand, a student may come from one of the more previleged levels of society and still be disadvantaged in school because he has not developed reading and verbal facility.

Those with average or above average intelligence can often make substantial gains in remedial courses when instruction is focused upon their specific weadnesses. Therefore, remedial courses need to be designed to incorporate instructional approaches to meet the wide spectrum of users in order to increase their effectiveness in preparing the largest number of students for success in regular community/junior college programs (Herber, 1970).

INVESTIGATION OF VARYING FACTORS

Rate and Comprehension

Russell (1970) summarized his survey of the literature on reading instruction by categorizing reading into the following aspects: word knowledge, comprehending the meaning of passages and thoughtful reaction, and the use or application of the ideas read. He cited studies in wich reading specialists also included the factor of speed at which the reader interpreted what he read.

Grob (1970) cited studies that indicated that the average reading rate among high school students who tested at or above grade level in standardized reading test ranged from 200-300 words per minute. The relationship of slow reading rate with academic difficulties was illustrated by analysis of the increased geometric proportion for a chapter test in American History. For a student reading 300 words per minute preparation time is 1 hour and 42 minutes; for a student reading 150 words per minute the time factor is 3 hours and 21 minutes, at 50 words per minute, a minimum of 10 hours is required. With concommitant reading assignments in other academic subjects these factors could signal academic disaster to the student with slow reading rates when confronted with new technical reading material.

Slow readers often score disproportionately low on standardized reading tests. Most tests are confounded by the rate factor (Stroud, 1958). The Nelson-Denny is a good example. Since the slow reader typically does not complete many of the vocabulary or comprehension items, his score is likely to be low. In contrast, showing him how to increase his speed in taking tests may result in improved scores regardless of what he does in the reading program. In addition Davis (1961), cautioned that test results must be constantly reviewed because guessing on test items can spuriously raise test scores, particularly when tests are administered to low achieving or unmotivated students who randomly mark answers even though they have had neither the time nor the skill to read the passages and answer the items.

In a study, Barbe (1952) used students who expressed a desire to improve their reading ability ranging in classification from college freshman to senior. The experimental group, composed of 25 subjects, worked for 12 weeks to improve their reading ability. The 25 subjects who made up the control group, were tested for reading ability but were given no help in reading improvement. At the end of 12 weeks, both groups were retested. The primary emphasis was on reading rate improvement without loss in comprehension. There was no prescribed reading list, rather a variety of materials was used. Subjects were encouraged to read material which had interested them. The mean reading rate of the experimental group increased 64 percent. The mean reading rate of the control group increased only 2 percent. Data also indicated that significant increases were maintained in reading rate with retention of reading gains 6 months after the termination of the program.

Smith and Tate (1953) did a study of reading rate and comprehension at the University of Kansas. Eighteen college students who read on the tenth to twelfth grade level practiced in weekly sessions using a reading accelerator. The reading material was extracted from popular novels. The results on the weekly tests showed that in the case of those subjects who continued training for 35 periods or more, substantial gains were made without significant comprehension losses. Two subjects who continued training until the end of the twelfth week (60 periods) achieved an average speed score of 917 words per minute with 70 percent comprehension as compared to their mark at the end of one week of 291 words per minute and 67.5 percent comprehension.

Flexibility of Reading Rate

According to Letson (1962) and McDonlad (1958), flexibility of reading rate rather than absolute speed was recently identified as a measure of reading efficiency. Teachers of developmental reading must know the meaning and value of flexibility. Letson recommended that flexibility skills be taught to both college bound and non-college bound students. He advocated early instruction in flexibility skills because he felt that there was a strong feeling on the part of many researchers that flexibility was an important skill necessary to a high level of reading efficiency.

Hill (1963) and Laycock (1962) defined flexibility as the ability to change the rate of reading in a coordinated reaction to purpose and/or difficulty of material. Berger reinforced this concept of flexibility. His definition involves purpose, experiential background of the reader, and material being read. He claimed flexibility must be considered in relation to the level of material being read. If one read a passage about physics in the local newspaper it would probably be easier to read than material about physics contained in a college textbook

There was an interrelationship between reading rate and flexibility. Subjects who showed a high flexibility rating were found to be able to maintain their high rates of comprehension while improving reading speed. They maintained better rates of comprehension than readers who had only one reading speed. Thompson and Whitehall (1970) reported that 39 students in a college developmental reading program were classified according to initial flexibility ratios. Low, medium, and high flexibility groups were formed. The hypothesis that the more flexible readers would accrue greater speed gains was supported. An analysis of variance and multiple comparisons conducted subsequently indicated that the high flexibility group gained more significantly than the low and medium groups. The immediate implication of this study pointed to the fact that flexibility must be considered as an input variable in teaching reading. In fact the author claimed that instruction in reading flexibility must be implemented immediately or the chances of realizing large and useful speed gains will be lessened.

Rate of reading has been of interest in investigations of reading ability for some time but the provisions of adequate tests to measure this ability has been hampered by the factors which are known to influence reading speed. The reading speed of any given reader has been shown to be dependent upon the purpose for which he is reading, and upon the complexity of the material being read (Shores and

Husband, 1950). There has been little success in attempts to formulate measures of reading rate which circumvent the problems that these factors introduce. Almost inevitably, the scores highly correlate with the level of reading or comprehension but the interpretation of speed of reading scores evidenced a lack of clear relationship to purpose in the reading (Applebee, 1973).

According to Berger (1972) the mature reader is the flexible reader, who has acquired the skill of varied reading rates. The student should be made aware that a major reason for developing a range of reading rates is to allow him to skim some materials at 1,000 words a minute and to read other materials at perhaps 25 words a minute.

Use of Mechanical Devices to Improve Reading Rates

Smith and Tate (1953) found the use of machines themselves a motivating factor in reading improvement. Students, by their settings of the reading rate controller and by their frequently expressed opinions, believed they were obtaining tremendous improvement in reading speed, a result of either the tachistoscopic training, or the practice on the reading rate controller, or from a combination of the two factors.

In discussing effective techniques for building the study skills of disadvantaged college students, Williams (1969) found a psychological advantage in using machines with these students. He stated that an effective way to provide remedial assistance was through utilization of automated instruction. Teaching machines permitted students to proceed at their own pace in an educational climate free of the anxiety and frustration which many disadvantaged students associated with the classroom scene.

Wilson and Leavell (1956) did a study to test the effectiveness of the SRA reading accelerator with students of average and superior I.Q. This study confirmed the value of the accelerator, in increasing rate of reading, especially in the reading of narrative material. The group using the accelerator showed an average increase of 80 words per minute within the normal I.Q. range and of 102 words per minute within the superior I.Q. range, which more than doubled the average increase made by the control group. This marked gain was accompanied by a similar gain in comprehension of narrative material within the normal I.Q. range and no loss within the superior I.Q. range. Weeden (1954) conducted a study at Brooklyn College, testing 150 "typical" freshmen. She compared mechanical vs. non-mechanical reading techniques. The results indicated that the group using the accelerator achieved greater improvement in rate but, interestingly enough, improvement in all other skills was equal for the two experimental groups.

With the continued use of mechanical devices in reading programs (corrective and developmental) there was a need for clarifying the róle and effectiveness of these devices in reading improvement courses (Nikas, 1965). The devices to which the author alluded were tachistoscopes, pacers or accelerators, and machines with left-to-right timed exposures. The intent of the study was to determine the differences as measured by results of the Nelson-Denny Test between groups of college students enrolled in a single semester reading course, which met 2 times a week and was taught by teacher-oriented or machine-oriented instruction.

Teacher-oriented, as defined in the study, referred to a class where the teacher conducted the class and was the center of the learning experience. Machine-oriented referred to a class where the teacher manipulated a machine and used lecture and lesson material prepared by the manufacturers of the machine. At the teacher-oriented class, the teacher lectured, discussed, and demonstrated techniques for effective reading improvement. The teacher was intellectually involved with the students and reading exercises revolved around lecture topics. This group practiced using exercises from many commercial reading workbooks, as well as vocabulary exercises and teacher-made tests.

In the experimental group, or machine-oriented class, the teacher acted as the recorder of the class. There was little intellectual involvement between teacher and student and the following was observed: There was no significant difference in reading improvement between a class which was defined as teacher-oriented and another class which was defined as machine-oriented. However, the data suggested that those students with high reading grade indexes made more reading gains than students with low reading grade indexes in a class which was teacher-oriented, while in a machine-oriented class, students of either high or low reading grade indexes tended to make similar gains.

Reading Rate Gains and Retention

In an extensive review of the literature, Standlee and Hooprich (1962) concluded: (a) significant gains in the speed of reading frequently were achieved and tend to be retained, (b) the influence of reading training on reading comprehension was somewhat uncertain since comprehension becomes confounded with speed, (c) no single approach or method of reading improvement has yet proved to be best for all cases, and (d) reading improvement courses were useful.

In a study of United States Air Force retrainees (1960), 26 one-hour lessons were presented via a specially designed projector. After 22 classroom hours a statistically significant gain in speed of reading without a significant loss in comprehension was attained among several groups as measured by a standardized reading test battery. Brim (1968) reported initial scores appeared to have had little or no influence on the magnitude of change. Subjects at both ends of the pre-test continuum appeared to gain equally well in reading achievement as measured immediately after the program and again 6 months later.

In a study done at Bethany College in Lindsborg, Kansas, Bumler (1958) tested the accelerator and tachistoscope on a group ranging in age from 18 to 52. He concluded that a period of training with the tachistoscope and accelerator resulted in a significant increase in reading speed and that no significant loss in either speed or comprehension resulted after a lapse of 6 months.

Cosper, Russell and Kephart (1955) reported in their study that college students should be encouraged to choose books and magazines which were of interest to them. Results of this study, too, indicated a significant increase in reading rate with retention of reading gain 14 months after the program.

Norman Lewis (1951) reported on a number of instances where clinics have had success in improving the reading ability of college students. The wide diversity of student population was indicated by the inclusion of the following clinic installations: The University of Florida, Dartmouth, City College of New York, and the Air University at Maxwell Field, Alabama.

SURVEY OF COLLEGE READING PROGRAMS AND PRACTICES

Peck and Brinkley (1970), in describing the ELECT program at Temple University, stated that their goal was to enable students who were otherwise qualified to achieve that language facility necessary for them to succeed in college. Based on results on the English Langauge Placement Examination and on informal speech and writing inventories, students progressed through the program according to their individual rate of achievement using generalized reading material.

Minkoff (1974) described the Reading Resource Center at Hunter College which predominately serviced liberal arts rather than technical or professional students. An attempt was made to isolate specific skills and determine students' level of proficiency so that specific goals could be set and tested. It was self-paced, self-motivated, and served students of many levels--not just remedial students. However, no substantial data was offered.

The Learning Assistance Program at Mt. Royal College in Canada as described by Rose, Demicele and Chase (1973) included a voluntary non-credit workshop. The program included the use of the Controlled Reader to help eliminate mechanical deficiencies such as regressions and word-by-word reading. There were three alternative learning formats: independent, tutorial, and group study.

Yuthas (1971) hired college tutors for an English Reading program at Metropolitan State College of Colorado. Tutors led discussions of study skills and note taking. This program used materials from SRA Lab III b, GH film strips from EDL in conjunction with the Controlled Reader. The positive relationship between participation in this reading program and persistence in college would indicate that low achievers should be encouraged to take remedial reading courses.

After remediating generalized scholastic skills of the academically underprepared student, efforts must be made to integrate reading and study skills with specific content curricula at the community college. There is a plethora of material in assigned text-books and supplementary professional journals related to a course of study which can be used as vehicles for reading instruction in each content area. Reading specialists have a tremendous potential to upgrade the level of student skills to complement, via a team effort, the content-teacher's curricula (Beitler, 1975)

Sargent (1969) contended that for reading improvement to be effective, the concept must be accepted that reading is not a course of study to be taught in isolation for a prescribed period of time. Rather, reading is a skill that must be augmented and reinforced in areas of study throughout the curriculum. It is apparent that although reading programs can deal with large numbers of disabilities with some success, the classroom can provide the vehicle to supplement the continued development of reading and its component skills.

To elicit the nature of the learning problems at

Queensborough Community College, Schwartz (1973) interviewed freshmen students enrolled in a Health Education course to determine, if possible, reasons for their failures in the course. Personal interviews were held with each student who received less than 60 percent. Among the findings were:

1. A segment of the population didn't read the assignments.
2. Another segment read the assignments, but had poor comprehension of the reading material, and
3. A majority had a limited knowledge of technical terms and an inadequate general vocabulary.

Carter (1970), found that teachers are continually confronted with the phenomenon that students learn subjects that interest them which are at a greater level of difficulty than simpler concepts. The development of more effective reading may be accomplished through the use of content course materials rather than relying on irrelevant exercises which may reinforce the lack of interest. The educationally disadvantaged student attempting matriculation on the college level is dependent upon the teacher to develop programs that do not dilute the content of the course but present it in a form that the student can cope with successfully.

Beitler (1974) supported the viewpoint that after remediating generalized scholastic skills of the academically underprepared student, efforts must be made to integrate reading and study skills with specific content curricula at the community college. The reading specialist in tandem with the content area teacher is capable of teaching new vocabulary, setting purposes for reading, developing and motivating student interest, identifying important concepts, and applying study skills to the textbook. In this way reading can be treated as a continuous process of development with the introduction of various reading skills within the content areas in order to increase the potential effectiveness and success of the students. Relevancy serves as motivation.

Baumell and Berger (1967) asserted community college students often had difficulty in reading comprehension and study habits. The development of suitable reading programs and teaching techniques were required in order to achieve scientific literacy in a technological society.

In addition to the absence of preparation on the post-secondary level, Beitler and Tuosto (1975) pointed out that the Allied Health curricula have unique requirements, such as:

1. Technical language and computational skill requirements,
2. Clinical practice requirements, and
3. Certification and licensure requirements (local, state, and/or national).

Students must be helped by committed, sympathetic, and creative faculty to deal with cognitive skills as well as subject matter dealing with clerical procedures while maintaining crucial performance standards vital to the life-science disciplines.

Twining (1972) helped to develop a reading program at Rhode Island Junior College which related to the continuing interest in teaching reading in the content areas. He agreed that reading is a continuous process of development which necessitated the introduction at the community/junior college level of various reading skills within the content areas in order to increase the potential effectiveness and success of the students.

Gilbert (1974) claimed that in order to support effective reading practices developing from the study of science, educators should make every effort to develop and use science textbooks which correlate highly with known readability levels of students. By creating the proper environment, teachers can provide suggestions whereby developmental reading may be implemented through the teaching of science.

Diekema and Hilton (1972) discussed the problems of disadvantaged students in Health Science programs. They stated that faculty have become increasingly aware that health professional schools are not geared to meet many of these special needs for minority students, in spite of increased staff and funds. Additional financial support was required so that the faculty could provide each student with the academic support basic to medical study through educational aids in order to alleviate the weaknesses of past educational backgrounds.

The concepts of lateral and upward mobility must be made more available to even disadvantaged students whose formal education is interrupted. Kuhli (1971) suggested that more attention be given to cumulative levels of education and experience so a student can climb as far and as rapidly as time, money, and special ability would permit. However, as part of the health delivery service, the allied health professionals are responsible for one standard of medical care and educators must meet this challenge of preparing qualified practitioners.

Kolzow (1972) suggested that the task of bringing reading into the content area at the two year college must be approached by the reading specialist. However, Kolzow gloomily reported that results of a survey at Harper Community College in Palatine, Illinois, indicated that the mood and readiness of the content area teachers had to be dealt with before they were ready to assume responsibility for intergrating reading into the content area, even on a team approach.

Reading programs have been developed to help community college students bridge the gap between skills acquired in high school and prerequisite skills necessary for success in college. These programs should be designed to include average or bright college students. The challenge is how best to meet the needs of a great diversity of student attitudes, capabilities, and interests regardless of their past academic record and level of performance.

Historically New York City Community College's credo has been to assist the student in the realization of his potential notwithstanding the extent of cultural deprivation he/she has suffered. To that end, the college has been committed to extend to the student all the available supportive educational assistance to prevent his/her drifting toward failure. The Science Reading Program developed, implemented, and evaluated in this study was designed to facilitate student success, promote the achievement of the departmental educational objectives, and ultimately, to advance and reinforce institutional goals.

Chapter III

DEVELOPMENT OF THE SCIENCE READING PROGRAM

The ability to read efficiently is the key to success in any of life's endeavors. Regardless of occupation or profession or stage in school, one must have good reading skills in order to keep abreast of the vast amount of reading material to be covered.

The average college freshman reads at 270 wpm. In order to increase reading efficiency, one must develop appropriate rates of speed determined by the difficulty of the material. One must keep in mind the purpose for reading this material in order to establish the proper rate. Highly technical material necessitates a slower reading rate while recreational material can be read at the maximum speed which the reader is capable of achieving. Effective reading requires flexible speed with an appropriate level of comprehension.

A specifically designed Science Reading Program has been developed which includes factors of increased speed with a minimum comprehension score of 70 percent. Specific procedures were necessary in order to develop, implement, and investigate the Science Reading Program. Many hours of preparation and a multiplicity of skills were involved in the design and realization of the project Briefly, the required steps and time allocation are detailed. See Table 1.

Table 1

Task Analysis for Development, Implementation, and Evaluation of a Science Reading Program

Task	Hour Allocation
I. Design of a program based on need as identified by communication with: A. Administrators of the college. B. Department chairpersons of the Division of Allied Health. C. H.E.W. National Institute of Health Manpower Education. D. Faculty in the Division of Allied Health and Developmental Skills. E. Students in the Division of Allied Health and Developmental Skills.	80 hours
II. Procedure for implementation of the program on an experimental basis for Sept. 1975 to include: A. Preparation of course syllabus for consideration by the Faculty Council. B. Conference with Curriculum Committee of Faculty Council. C. Conferences with chairpersons in the Division of Allied Health to schedule group-based classes and individual follow-up instruction. D. Meetings with coordinators of the Computer Center, Buildings and Grounds and Department Program Committees (room assignment, student program, etc.)	60 hours
III. Procedure for utilizing the program: A. Directions for the student. B. Guidelines for the instructor 1. Group-based instruction 2. Individual follow-up sessions	40 hours

IV. Collating the science materials by:
  A. Choosing appropriate passages that are science-oriented (60 passages approximately 500 words on 3 levels of difficulty).
  B. Determining readability level.
  C. Writing comprehensive questions to include a range of reading comprehension skills. 240 hours
  D. Tracking Student Progress:
    1. Designing charts for recording results.
    2. Designing graphs for reporting progress.
  E. Editing the type materials.

V. A. Field testing the materials with:
    1. tutors
    2. freshman
    3. faculty
  B. Revise questions based on information from: 60 hours
    1. item analysis determination.
    2. feed-back from preliminary participant.

VI. Evaluation of Components:
  A. Selection of standardized test (*Nelson-Denny Reading Test*) as an instrument for pre- and post-testing.
  B. Administration, scoring, and recording results of pre- and post-forms of *The Nelson-Denny Reading Test*.
  C. Collection of Data to include: 100 hours
    1. Initial reading grade level and rate.
    2. Final reading grade level and rate.
    3. Number of selections completed, etc.
  D. Analysis of data utilizing appropriate statistical tools.
  E. Interpretation and implication of results.

VII. Completing the Study
  A. Writing the narrative for:
    1. research of the literature.
    2. all required components of MARP. 150 hours
  B. Proofread and edit the study.

COMPONENTS

Science Reading Passages

A large number of college students are frustrated in their efforts to cope with the academic situation. In addition, the amount of information pertinent to a given professional discipline is rapidly increasing to accommodate the new insights that research is providing. This increases the academic pressures of underachieving and low achieving students. The students in Allied Health programs are particularly handicapped since there is a need to master new and technical language as well as specific clinical procedures in order to survive. Although instructors in the Allied Health professions are sympathetic to student needs, they are faced with the obligation of maintaining the quality of academic competence in the delivery of health service.

The Science Reading Program was designed to meet the reading and study skill needs of post-secondary students seeking to successfully complete careers in the Allied Health profession. This program may aid the student in the development of academic competencies basic to success in the Allied Health fields. Basically it aims to develop three kinds of skills:

1) Input skills--comprehension and vocabulary development in the science areas.

2) Processing skills, e.g., interpretation of science control.

3) Output skills--decoding the new technical language of the Health Science.

The acquisition of these skills may enhance the performance of the student completing the Allied Health programs which would result in the number of qualified health technicians in the field.

Through the use of the SMOG Readability Formula, (McLaughlin, 1969) science reading passages at three levels of difficulty were prepared:

1) Level IA (7th Grade Reading Level), IB (8th Grade Reading Level),

2) Level IID (10th Grade Reading Level), IIE (11th Grade Reading Level), IIF (12th Grade Reading Level), and

3) Level IIG (13th Grade Reading Level), IIIH (14th Grade Reading Level), IIIJ (15th Grade Reading Level).

All passages were selected from textbooks and professional journals to reflect the content and style of science reading materials used in the Allied Health curricula. In this way, students will not be left with the burden of transferring acquired reading skills from generalized materials to science content. See Exhibit 1 for a prototype of a science reading passage.

Exhibit 1

Sample Reading Passage

Many of us think of the cell as the lowest level of animal life. However, the cell is a very complicated organism, which probably required several billion years to develop. After the earliest form of life, the virus, first appeared on Earth. The smallest known virus has a diameter of approximately 15 millimicrons, followed by rickettsia (approximately 150 millimicrons), bacterium (approximately 1 micron) and cell (5-10 microns). Thus the cell has a diameter about 1000 times that of the smallest virus, and therefore, a volume about 1 billion times that of the smallest virus. Correspondingly, the functions and anatomical organization of the cell are far more complex than those of the virus.

The principal constituent of the very small virus is a substance called nucleic acid. This is an autocatalytic substance, which means that it is capable of reproducing itself if appropriate nutrients are available. Thus the virus is capable of propagating its lineage from generation to generation and, therefore, is a living structure in the same way that the cell and the human being are living structures.

As life evolved to the large viruses, other chemicals besides nucleic acid became a part of the organism, and specialized functions began to develop in different parts of the virus. A membrane formed around the virus, and inside the membrane a fluid matrix appeared. Specialized chemicals developed inside the matrix to perform special functions; protein enzymes appeared which were capable of catalyzing chemical reactions and, therefore, of controlling the organism's activities.

In the rickettsial and bacterial stages organelles developed, representing aggregates of chemical compounds that perform functions in a more efficient manner than can be achieved by dispersed chemicals throughout the fluid matrix. And, finally, in the cell stage more complex organelles developed, the most important of which is the nucleus. The nucleus distinguishes the cell from all lower forms of life; this structure provides a control center for all cellular activities, and it also provides for very exact reproduction of new cells generation after generation, each new cell having essentially the same structure as its progenitor.

Ten comprehension questions accompany each passage and measure the reader's ability to recognize the main idea, to recall facts, to draw conclusions, to make inferences, and to identify the meaning of vocabulary when used in context. The answer keys were structured to indicate the type of each question, for ease in diagnosing the student's responses to the comprehension questions related to the reading. The following coding system was developed to identify the specific reading skills:

A. Detail (factual recall) □

B. Main idea △

C. Vocabulary in context ○

D. Drawing conclusion ◇

Since reading-study material requires recall and retention of information, a score of 70 percent was established as the minimal acceptable level of comprehension. See Exhibit 2, which follows for an example of the comprehension questions.

Exhibit 2

COMPREHENSION QUESTIONS WITH IDENTIFIED READING SKILLS

1. The purpose of this passage is:

   a) to describe viral forms
   b) to compare cellular and pre-cellular forms
   c) to describe the functions of bacteria
   d) to describe the functions of nucleic acid

2. The simplest known form of life is:

   a) a cell
   b) a rickettsia
   c) a bacterium
   d) a virus

3. Nucleic acids are not:

   a) autocatalytic substances
   b) the main constituents of viruses
   c) proteins
   d) constituents of cells

4. The nucleus of a cell

   a) contains most of the nucleic acids
   b) contains no nucleic acids
   c) contains a small portion of the nucleic acids of a cell
   d) distinguishes cells and bacteria from lower forms of life

5. Organelles are: (see paragraph 4)

   a) simple organs consisting of relatively small numbers of cells
   b) subcellular entities
   c) enzymes
   d) proteins

6. Hereditary traits of all living things:

    a) are a function of the environment in which they exist
    b) are regulated by the function of nucleic acids
    c) are regulated by a code in the protein enzymes
    d) are a matter extra cellular functions

7. A membrane is: (see paragraph 3)

    a) a liquid surrounding vital organs
    b) a bone
    c) the central core of a cell
    d) a skin-like substance

8. The passage deals mainly

    a) with the organization of a cell
    b) the evolution of life from simple to complex
    c) the function of enzymes
    d) the hereditary code

9. The term closest in meaning to lineage in paragraph 2 is:

    a) family line
    b) viral coefficient
    c) straight line
    d) structure

10. Which is most likely to constitute the building material for higher organisms?

    a) bacteria
    b) rickettsia
    c) cells
    d) viruses

A list for Levels I, II, and III, of all the science reading passages have been compiled. These passages have been identified by first line rather than title because the title would serve as a clue for responses to the comprehension questions dealing with, "finding the main idea." See Exhibit 3 for listing of science reading passages developed for use by students enrolled in this program. Passages were categorized by Reading Grade Level I, II, and III, and chronologically sequenced in order of difficulty within Levels, as determined by the SMOG Readability Formula.

Reading Accelerator

The Science Reading Program uses a Science Research Associates (SRA) reading accelerator (Simpson, 1963) to aid the students in the development of more effective reading habits.

The SRA reading accelerator has a dial-controlled shutter which provides alternate pacing as the student reads his assigned passage by covering one line of the reading selection at a predetermined rate. As the student's eyes are trained to adjust to the movement of the descending arm, the eyes are forced to move across and down the page, which reduces inefficient eye regression. By maintaining a minimum level of performance of 70 percent correct on ten comprehension questions based on each of the reading passages, the student can steadily increase reading rate until maximum speed with accuracy is achieved. See Figure 1.

To avoid dependency on a mechanical device, this program required students to time reading paragraphs every third science passage without the use of the accelerator. The ultimate goal of education is to free the student of all dependency, whether on teacher, tutor, or mechanical device. Only in this way can the student evolve into the professional who will update his skills independently through the reading of professional journals, attendance at workshops, and participation in professional societies.

FIGURE 1

READING ACCELERATOR

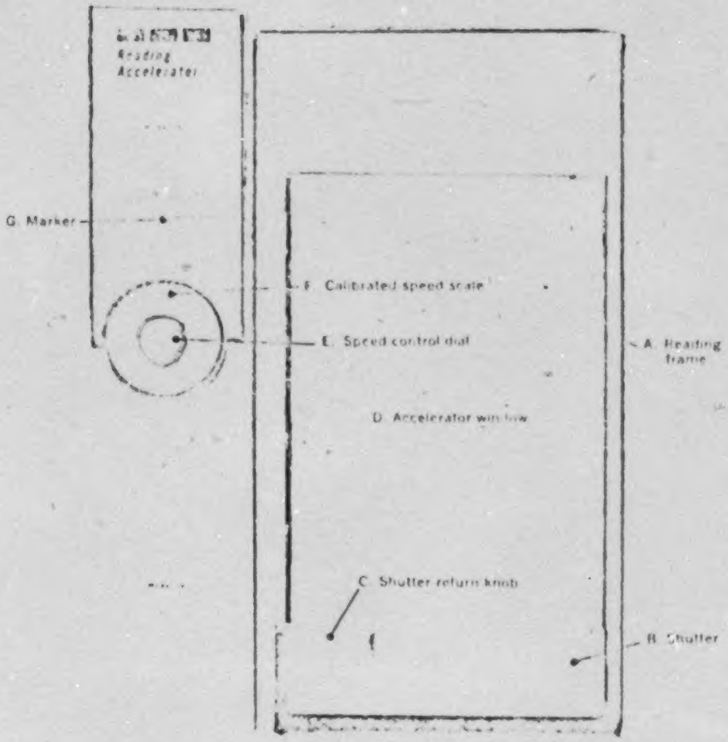

Reading
Accelerator
G. Marker
F. Calibrated speed scale
E. Speed control dial
A. Reading frame
D. Accelerator window
C. Shutter return knob
B. Shutter

Exhibit 3

Science Reading Passages According to Level I

Code	First Line	WC
GS IA-1	Nervous tissue is made of cells called...	100
GS IA-2	The second group of vertebrates...	170
GS IB-1	Maurice Maeterlinck a famous	180
GS IB-2	Breads often become moldy	150
GS IB-5	Living things must produce off-spring	190
GS IB-6	How is the sex of a baby developed	170
GS IB-7	Are you surprised to hear that yeast is alive?	140
GS IB-8	When we think of birds, we think	180
GS IB-9	An ameba splits in half by fission	170
GS IB-10	One large group of animals is the invertebrates	180
GS IB-11	She's got her father's eyes.	170
GS IB-12	Can you imagine a world without heat?	200
GS IB-13	Would you try picking up an aluminum pot	190
GS IB-14	The pencil you use probably has an	170
GS IB-15	Hearing means we must	190
GS IC-1	Our world is made of matter	150
GS IC-2	You have seen that there are some very simple	190
GS IC-3	New cells are formed from old cells	160
GS IC-4	Mammals are warm-blooded animals	170
GS IC-5	Before we examine heredity in human beings	160
GS IC-6	In asexual reproduction there is only one parent	160
GS IC-7	Animals which have a backbone are called vertebrates	170
GS IC-8	Most of the less developed plants	160
GS IC-9	Heat is not matter. Therefore, it	185
GS IC-10	How often have you heard people say	180
GS IC-11	Suppose you have a two quart saucepan	175

Exhibit 3

Science Reading Passages According to Level II

Code	First Line	WC
GS IIA-1	If a plant or animal is successful in all its	150
GS IIA-2	Epidermis is plant covering tissue	160
GS IIA-3	If growth is a response to	160
GS IIA-4	All well-developed species have a	150
GS IIA-5	From your study of chemistry	160
GS IIA-6	Mendel's reports written in 1865	170
GS IIA-7	Man uses many plants and animals for food	180
Med IIA-1	The illness diabetes has been known for	160
Den IIA-1	Each tooth has a crown and root portion	180
GS IIA-8	If you look around the classroom	150
GS IIB-1	The movements of most animals result from	90
Med II B-1	Pulse is the throbbing of an artery as it is felt	220
GS IIB-2	The starfish is well protected by a skeletal	200
GS IIB-3	Our planet has the wrong name	170
Med IIC-1	The circulatory system is the mechanism	160
GS IIC-1	Matter is anything that has weight	100
Med II C-2	Oxygen gets in the cells of the body	200
GS IIC-2	The fungi are specialized kinds of organisms	140
Med IIC-3	If a person's entire body is exposed to rather	165
Den IIC-1	*In vitro* experiments of early	160
O.D. IIC-1	In no area of ophthalmic dispensing is it more	200

Exhibit 3

Science Reading Passages According to Level III

Code	First Line	WC
GS IIIA-1	The fluid compartment of every living cell	90
GS IIIA-2	It is everyday knowledge that a liquid will	210
Med IIIA-1	As a result of its metabolic activity	170
GS IIIA-3	Matter exists in three physical states	170
Med IIIA-2	One group of mentally defective children	160
GS IIIA-4	Although not very plentiful	160
GS IIIA-5	Connective tissue which includes bone	80
GS IIIA-6	Air pollution is a subject of much current	180
Den IIIA-1	The crowns of the incisors & canines have	170
Den IIIA-2	The lipoma is a common benign neoplasm which	150
GS IIIB-1	Epithelial tissues are composed of cells	90
Med IIIB-1	The most common and characteristic symptoms	170
GS IIIB-2	In summary, the atom	160
GS IIIB-3	Five important questions that confront the	170
GS IIIB-4	Epithelial tissue covers the body	160
GS IIIB-5	The cell grows from within	160
Den IIIB-1	At birth, the individual has no functional teeth	160
Med IIIC-1	Biology, the study of function	90
Med IIIC-2	Anatomy is the science of the structure of	100
GS IIIC-1	What do proteins do in plant and animal cells	170
GS IIIC-2	Each cell contains a small, usually spherical	110
Med IIIC-3	It is the physician's responsibility to	200
GS IIIC-3	Many of us think of the cell as	140
GS IIIC-4	In addition to the natural contaminants	160
GS IIIC-5	If, as indicated in the preceeding sections	160
GS IIIC-6	Chemists of the early 19th century had	160
GS IIIC-7	It seems logical to start our survey	160
Med IIIC-4	The patient with pneumonia has a temperature	160
GS IIIC-8	A common observation is that cats	
GS IIIC-9	When powdered starch is	140

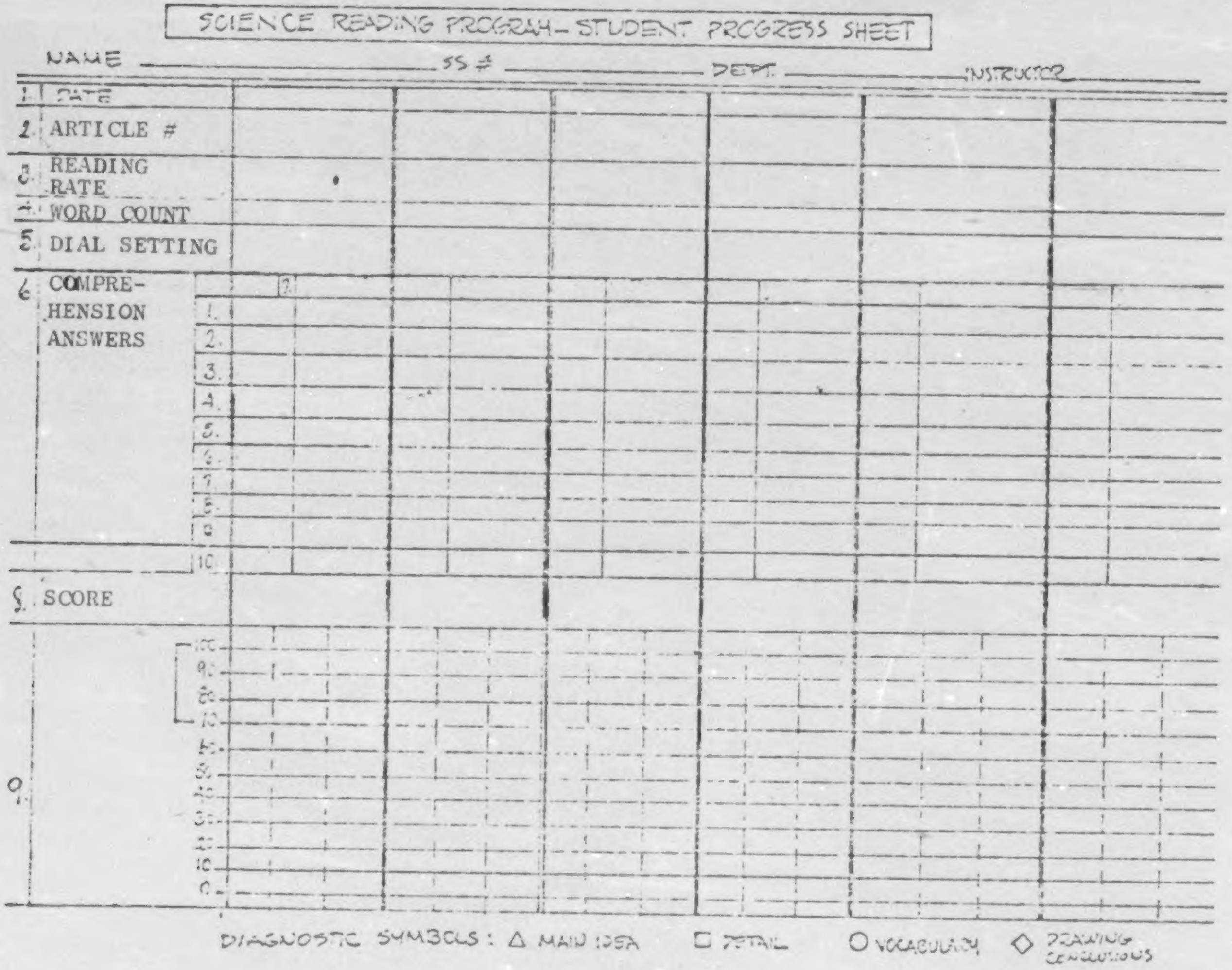
Reporting and Recording System

Criteria for evaluation of realistic goals were established cooperatively by both teacher and student. An answer sheet was designed which provided space for self-administered responses to the comprehension passages. This record provided a profile of the student's program in the development of reading skills, reading rate, comprehension score, and a graph to illustrate trends. The format of the Answer Sheet permits ease of diagnosis of the type of reading skills needing development, current reading rates, coded reading passage comprehension score, and a graph to illustrate trends. See Exhibit 4 for the Student Progress Sheet for the Science Reading Program.

The literature supports the view that remedial work should not be arbitrarily imposed for the population participating in this program. Unlike the child-learner, who will submit to testing, not persist in sharing the test results, and will complete tasks to which he/she is directed, the adult-learner must understand the reasons for the program in which he is engaged and acquiesce in the method of arriving at his goal. To maximize the effectiveness of this program, students were encouraged to be an active participant in the diagnosis and prescription of the reading activities.

Exhibit 4

Student Progress Sheet



SCIENCE READING PROGRAM – STUDENT PROGRESS SHEET

NAME ______________ SS # ______________ DEPT. ______________ INSTRUCTOR ______________

1. DATE
2. ARTICLE #
3. READING RATE
4. WORD COUNT
5. DIAL SETTING
6. COMPREHENSION ANSWERS 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.
8. SCORE
9. 100 90 80 70 60 50 40 30 20 10 0

DIAGNOSTIC SYMBOLS: △ MAIN IDEA ☐ DETAIL ○ VOCABULARY ◇ DRAWING CONCLUSIONS

STUDENT PLACEMENT AND PROGRESSION

Based on scores on The Nelson-Denny Reading Test, Form A (1960), the student is assigned an entry Reading Level category (Level I, II, or III). Within each category are reading grade subdivisions. Each student must be accurately placed within the subdivisions in relation to his level of comprehension and reading rate. See Figure 2 detailing the steps for progression through the reading program.

Students are permitted flexible scheduling to participate in the individual follow-up sessions of the program. The Learning Center was open from 9-5 P.M., 5 days a week. The Center housed student folders which included reading rate answer sheets, charts for recording comprehension scores and reading rates, number of passages read, records of attendance, and logs for student and instructor's comments.

PROCEDURES FOR OPEN LABORATORY ACTIVITIES

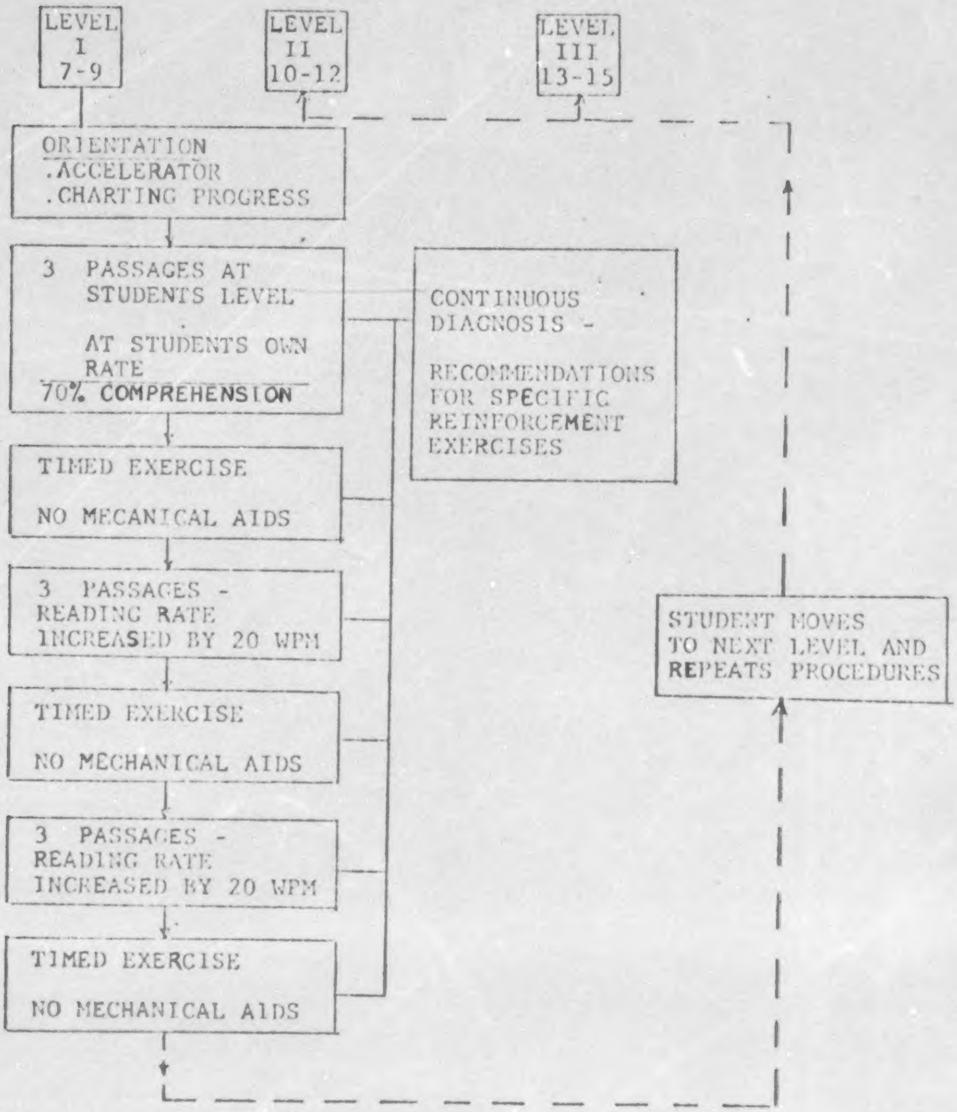
1. The students received their folders, reading accelerators, and reading selections which had an assigned Reading Grade Level.
2. The student read the selection, answered the comprehension questions, checked his own answers, and recorded the results.

3. The student and instructor evaluated results. Some of the identified deficiencies in reading skills required additional exercises for skill development. This dialogue was encouraged because learning is more effective when adult students participate in the process of evaluating their own reading skills.
4. The instructor and student analyzed responses to the selected reading in terms of the following reading skills:
    a) Determination of the meaning of words, phrases, clauses, and sentences through the use of contextual clues.
    b) Recognition of the main thought and supporting details of a paragraph and a 400-500 word science selection.
    c) Recognition of the interrelationship of ideas within a science selection.
5. After reading two science passages with 70 percent comprehension, the student read the next passage without the accelerator to encourage independence from the machine.
6. After reading two science passages at a predetermined rate with minimum comprehension of 70 percent, the student increases his rate at a minimum of 20 words per minute.

7. When the student has successfully completed 9 passages and increased his speed at 60 words per minute, he/she proceeds to the next level of reading difficulty.

FIGURE 2

Activity Chart Indicating Progression Within the Science Reading Program


LEVEL I 7-9
LEVEL II 10-12
LEVEL III 13-15
ORIENTATION
.ACCELERATOR
.CHARTING PROGRESS
3 PASSAGES AT STUDENTS LEVEL
AT STUDENTS OWN RATE
70% COMPREHENSION
CONTINUOUS DIAGNOSIS -
RECOMMENDATIONS FOR SPECIFIC REINFORCEMENT EXERCISES
TIMED EXERCISE
NO MECANICAL AIDS
3 PASSAGES - READING RATE INCREASED BY 20 WPM
TIMED EXERCISE
NO MECHANICAL AIDS
3 PASSAGES - READING RATE INCREASED BY 20 WPM
TIMED EXERCISE
NO MECHANICAL AIDS
STUDENT MOVES TO NEXT LEVEL AND REPEATS PROCEDURES

Chapter IV

IMPLEMENTATION OF THE SCIENCE READING PROGRAM

THE SETTING OF THE STUDY

New York City Community College, in existence approximately 25 years, is one of the oldest established community colleges in the United States. It serves the New York City metropolitan area but particularly draws its student body from Brooklyn and lower Manhattan. New York City Community College is a career-oriented school divided into the Division of Commerce, Liberal Arts, Allied Health, and Technology. 80 percent of students enrolled in New York City Community College are programmed for career-oriented courses of study. The special characteristics of New York City Community College are in its unique diversity. Alfred (1975:12) reports that the college has an enrollment of about 18,000 students, more than half of whom are Black and Puerto Rican.

The Division of Allied Health at New York City Community College is comprised of approximately 1700 students and 180 faculty members. There are 7 career curricula that are offered: Pre-Pharmacy, Dental Hygiene, Dental Laboratory Technology, Medical Laboratory Technology, Nursing, Ophthalmic Dispensing, and Radiologic Technology.

The college offers 28 degree-granting programs authorized by the New York State Board of Regents. The Associate Degree is awarded in Applied Science, in Science and Arts. These degree programs are administered through 4 divisions.

The Science Reading program was instituted in the Fall on an experimental basis. This study evaluated the program in terms of effectiveness for students in the Division of Allied Health. If warranted, this Science Reading Program will serve as a prototype for replication in the 3 other divisions of the college: Commerce, Liberal Arts, and Technology.

POPULATION

This Science Reading Program was designed specifically for students enrolled in the Division of Allied Health and Natural Sciences at New York City Community College. There are 7 departments that traditionally draw different populations. Each department has specific entrance criteria based on such factors as high school average and level of science and math requirements. The range of ages of the subjects are from 18 to 40. Minority distribution includes Black, White and Spanish surnamed students, and Other. The impact of Open Admissions which commenced on September 1970, was dramatic. See Table 2 for the pronounced change in the distribution of grade point average of high school graduates entering the Nursing Department from 1969 through 1974.

Table 2

High School Average of
Freshman Nursing Students

Year	75+ Reg	70-74.9 A	69.9 B
1969	98%	2%	-
1970	54%	27%	19%
1971	55%	32%	13%
1972	-	50%	50%
1973	76%	20%	3%
1974	72.5%	19.5%	8%

In assessing the academic achievement of the entering freshman student by high school grade point average, figures indicate the radical change in the new population. In 1969 the academic profile of 98 percent of the entering Nursing students was composed of a minimum of 75 percent school grade point average. In 1970 only 54 percent of the entering freshman Nursing students had above 75 percent grade point average. An examination of the results of standardized tests of freshmen students in the Division of Allied Health indicates a range of reading grade scores from 5.8 to 15. See Table 3.

Table 3

Freshmen Reading Grade Levels in the Division of Allied Health

Department	1973 Range	1973 Mean	1974 Range	1974 Mean
Chemistry	6.5-14.6	10.0	6.7-13.9	10.02
Dental Laboratory	6.2-15	10.5	6.1-13.7	10.0
Dental Hygiene	6.2-15	11.6	7.4-14.6	11.9
Nursing	7.0-14.6	10.0	5.9-13.9	9.9
Ophthalmic Dispensing	7.0-14.6	11.0	6.7-13.9	10.7
Radiologic Technology	5.8-14.6	9.7	6.1-13.9	10.9
Medical Laboratory	6.2-15.0	10.6	6.7-15.0	10.9

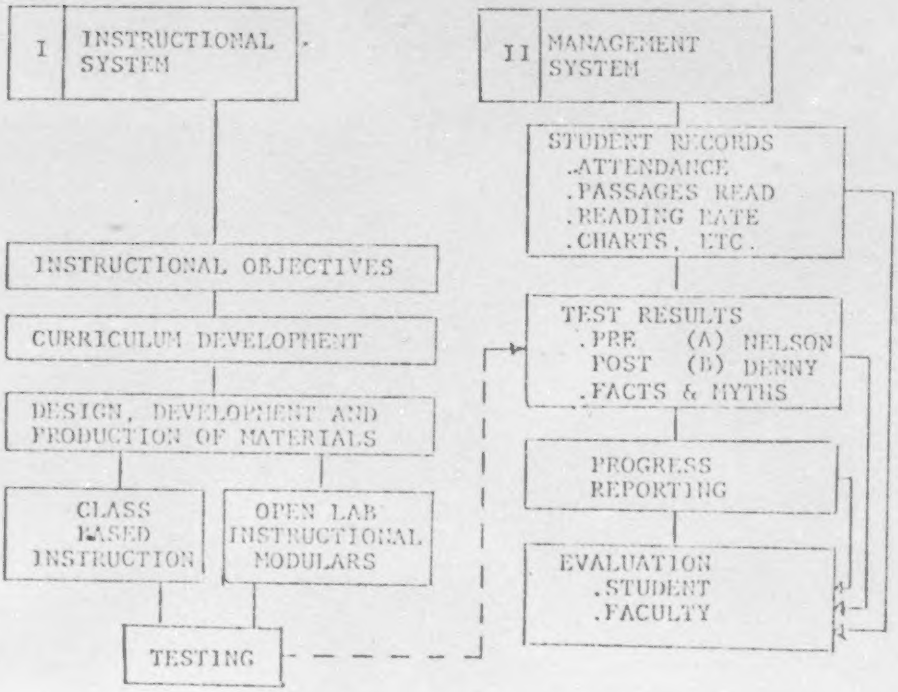
This data must be evaluated in terms of the varying standards and the decreasing demands of the high school curriculum. Statistics indicate that N.Y.C.C.C. students are: Most likely to come from a minority population, working and living in the college's immediate vicinity, most likely to have limited reading and study skills, and most likely to have a high school grade point average of 70-75 percent.

SYSTEMS REQUIRED TO IMPLEMENT THE PROGRAM

In order to establish the Science Reading Program, a Systems approach was delineated with guidelines for the management of instruction--See Figure 3. Discussion of the relationship among the components as well as exhibits detailing each aspect will follow in this chapter.

Figure 3

Major Systems Required to Implement The Program


I INSTRUCTIONAL SYSTEM
INSTRUCTIONAL OBJECTIVES
CURRICULUM DEVELOPMENT
DESIGN, DEVELOPMENT AND PRODUCTION OF MATERIALS
CLASS BASED INSTRUCTION
OPEN LAB INSTRUCTIONAL MODULARS
TESTING
II MANAGEMENT SYSTEM
STUDENT RECORDS
.ATTENDANCE
.PASSAGES READ
.READING RATE
.CHARTS, ETC.
TEST RESULTS
.PRE (A) NELSON
POST (B) DENNY
.FACTS & MYTHS
PROGRESS REPORTING
EVALUATION
.STUDENT
.FACULTY

INSTRUCTIONAL COMPONENTS OF THE SCIENCE READING PROGRAM

The building blocks for the instructional system for both group-based and individualized instruction include the rationale, instructional objectives, instructional methodology, and specific instructional materials.

Students received group-based instruction in 2, two-hour sessions. The first session established the participant's base reading level and identified factors of reading rate and level of comprehension. An appropriate entry science passage was given each student based on the results of The Nelson-Denny Test.

The second session focused on the use of the reading accelerator, conversion tables for determination of proper reading rate settings, and recording procedures for the "Reading Rate Answer Sheet and Graph." See Appendix E for the course document and materials distributed to a student for use throughout the program.

The 2 group-based instructional sessions were developed into video-taped presentations for use by students who were absent or who wished to review the material. For the story board of the group-based instructional sessions titled "Establishing Base Level Data", see Appendix F. A video tape of the group-based instructional session, "Use of the Reading Acceleratory and Charting Progress", was also developed for use by students who were absent or wished to review the lesson.

COMPONENT: GROUP-BASED INSTRUCTION - SESSION I

Rationale

Efficient textbook and journal reading requires not only the attainment of good comprehension skills but the acquisition of a reasonable effective reading rate. The establishment of each student's reading rate will enable the Open Laboratory instructor to prescribe an individualized program to develop this skill.

Instructional Objectives

1. Given a reading passage and appropriate instruction, each student will determine base reading rate with 100 percent accuracy.
2. Each student will determine, record, and draw a bar graph of reading comprehension level with 100 percent accuracy.

Instructional Methodology

Establishing Initial Reading Rate Level

1. Determination of individual reading rates using reading passages assigned according to each student's base reading grade level. See Appendix G for base level reading passages written at 3 different readability levels with accompanying questions.

2. Discussion procedures for determining and recording reading rate and comprehension level.
    a. Each student determines the amount of time needed to complete the reading of a passage written at the student's base reading level and calculates own base reading rate in words per minute. See Figure 4.
    b. Each student determines his own level of comprehension by answering questions referring to the base reading passage, scoring the answers, recording score, and plotting a bar graph of his reading comprehension level.

Guidelines for Instructor's Use

1. Students shall have been pre-tested and reading grade level determined.
2. Each student receives a folder which will contain:
    a. a reading passage which corresponds to their pre-tested grade level. (Passages are lettered from A-F. "A" = 7th grade, "B" = 8th grade, etc. Grade Level 13 and above receive level "F".)

   b. a set of questions which correspond to graded passage (Passages A and B receive questions lettered "H" and passages C-F, "I").
   c. a work sheet
   d. a reading rate student answer sheet
   e. student-instructor comment sheet
3. Student folders shall have been previously filled out with student's name, major department, etc.
4. Instructor shall have students take out work sheets and will explain timing procedure for passages and timing procedure for questions.
   a. Each student will start to read his passage at the same time.
   b. When student finishes passage, he will record, on the work sheet, the number of minutes and seconds that have elapsed.
   c. On completion of questions, the student will record the time elapsed in minutes and seconds in appropriate space on the work sheet.
5. Students shall be instructed to answer questions on Reading Rate Student Answer Sheet. NOT ON QUESTION PAGE.

6. Students will be instructed in conversion of minutes and seconds to seconds. See Figure 4 for Worksheet for Determining Reading Rate.
7. Students will be told the number of words in each passage and remaining arithmetic is performed to reach words per minute.
8. Students will be given the answers to the questions and told to grade their answer sheet and fill in the graph at the bottom of answer sheet.
9. Student will indicate how many words per minute he was reading and his percent comprehension reading grade level.

Instructional Methodology

Use of Reading Accelerator

1. Demonstration of the use of the reading accelerator
   a. Functions
   b. Parts
   c. Maintenance
2. Discussion of word count graph
3. Practice with reading accelerator and word count graph.

FIGURE 4

WORK SHEET FOR DETERMINING READING RATE

PASSAGE

Time Started: ____________

Time Completed: _____min. _____sec.

CONVERT TIME TO SECONDS

60 x _____min. + _____sec. = T □

QUESTIONS

Time Started: _____min. _____sec.

Time Completed: _____min. _____sec.

60 x _____min. + _____sec. = T □

TO CALCULATE READING RATE

1. P = # of words in the passage ⬡
   T = the total # of seconds it took you to read the passage □

2. To calculate your Rate divide P by T

   T) P = # of words per second

   ○ # of words per second

   □) ⬡

3. ○ x 60 = ____________ your reading rate in words/minute

COMPONENT: GROUP-BASED INSTRUCTION - SESSION II

Use of Reading Accelerator

The Reading Accelerator is an effective instrument for developing reading speed among students. Good reading rate coupled with high comprehension provides for the development of the optimum textbook study. Theory courses in the Allied Health curricula rely heavily on home study of the text and journal materials.

The reading accelerator uses a descending arm over a reading passage to pace the student. The rate of descension is determined by a dial which is set by the student. The dial setting is determined by the word count of the passage and the student's previous reading rate.

Instructional Objectives

1. Given 5 reading passages, the student will be able to use the conversion table to determine the appropriate reading rate setting to be used on the accelerator with 100 percent accuracy.
2. Given increased reading rates, the student will be able to readjust the dial on the accelerator to accommodate increases in reading rate with 100 percent accuracy.

Guidelines for Instructor's Use

1. Student will be given the following:
    a) his folder
    b) reading accelerator
    c) conversion chart
    d) reading symbol sheet
2. Students will be instructed in the use of the accelerator
    a) reading below arm
    b) placement of passage under window
    c) setting of speed control (control chart)
    d) word count for each passage
    e) instructor will give each student his new reading speed according to previous weeks' rate and comprehension.
    f) student will be asked to use Conversion Table and according to new reading rate and word count on passage to be read, he will set the accelerator speed control.
3. Students will be given a passage (with ten comprehension questions) to read under the accelerator.
4. Instructor will show student which answers correspond to designated symbols to aid in diagnosing problem areas.
5. Students will complete graph on Reading Rate Answer Sheet.

COMPONENT: INDIVIDUALIZED INSTRUCTION

Individual Use of Science Reading Modules

Continuous development of reading skills through bi-weekly practice will enable the Allied Health student to develop and maintain an effective reading ability. Relevant science reading passages drawn from journals and textbooks in the natural, physical, dental, and medical sciences provide high motivational interest. Reading skills developed through science materials have a high degree of transference to the Allied Health learning situation.

Instructional Objectives

1. Given a series of scientific reading materials and practice exercises, the student will increase his rate of reading to a maximum of 50 words per minute above his initial reading rate.
2. Given a series of reading skill exercises, the student will answer questions with 80 percent accuracy on:
   - a) Locating the main idea
   - b) Finding supporting detail
   - c) Identifying vocabulary in context
   - d) Drawing conclusions

3. Given a chart for recording student progress, the student will be able to:
   a) Record reading rates and levels of comprehension with 100 percent.
   b) Diagnose the errors made in comprehension by referring to a predetermined code with 100 percent accuracy.
   c) Shade in portion of the chart to indicate progress made with 100 percent accuracy.

Instructional Methodology

Science reading passages are prescribed according to the student's interests and ability by the Open Laboratory instructor. The accelerator rate is determined by the student's base rate and comprehension level.

Reading passages are also used without the reading accelerator to avoid dependence on the instrument. The reading time for each student on these passages is determined in order to continuously monitor the student's reading speed development. See Exhibit 5, for Student-Teacher Comment Sheet. Patterns of error are often noted on a comment sheet. This provides a means of communicating prescriptive follow-up activities for each student in the program.

Exhibit 5

STUDENT-TEACHER COMMENT SHEET

DATE	ARTICLE #	COMP. SCORE	STUDENT'S COMMENTS	INSTRUCTOR'S COMMENTS

Chapter V

EVALUATION OF THE SCIENCE READING PROGRAM

This study is composed of 3 phases: the development, implementation, and evaluation. The development and implementation phases have been previously described in chapters III and IV. The evaluation model detailed in this chapter will serve as an index to meet concerns of accountability to the consumer, in this case Nursing and Dental Hygiene freshmen admits. The investigation will attempt to determine the effectiveness of the specially designed Science Reading Programs in terms of its' objectives, multi-sensory activities, and student characteristics.

SUBJECTS

The chairpersons of the Dental Hygiene and Nursing Departments of New York City Community College recommended that freshmen students participate in the Science Reading Program. Although the chairpersons strongly encouraged attendance, no penalties resulted if students chose not to actively participate. A total of 100 students were enrolled in this non-credit course, offered on an experimental basis this academic year.

The control group, composed of 58 students who read 6 science passages or more, were categorized as Active participants. Students in both the Inactive and Active Groups were initially categorized into Levels I, II, and III according to their entry reading abilities. See Table 4.

Table 4

Subjects Categorized According to Reading Levels

Groups	Active	Inactive	Total
I	14	13	27
II	19	14	33
III	25	15	40
Total	58	42	100

STATISTICAL MEASURES

The analysis of variance technique was used to examine hypothesis 1. Analysis of variance can compare many different independent variables at one time with a dependent variable, such as reading scores at the end of a course.

Hypotheses 2, 3, and 4 were examined according to the t-test for correlated samples. This tool permits examination of the difference between 2 sample means in order to determine if the difference is likely to be a chance or a real difference.

The Pearson product-moment correlation was used to derive correlations for examining hypotheses 5 and 6.

This technique permits the statistical examination of the relationship between 2 variables. This test measured the relationship between the given number of passages read and mean gain reading score.

Hypothesis 7 was examined through the use of a chi square analysis. This permits the measure of the deviation of the observed distribution of scores from that which was expected.

The level of significance was established at the $p < .05$, which means that the probability of chance occurrence of less than .05 was considered significant.

METHODOLOGY

In September 1975, 100 Nursing and Dental Hygiene freshmen students were enrolled in an experimental Science Reading Program. The Nelson-Denny Reading Test, Form A and the Facts or Myths Inventory were administered to these students during the first week of the academic term prior to formal classroom instruction.

For 15 weeks the students were encouraged to attend the Open Laboratory from 9:00 A.M. to 5:00 P.M. and to use the especially prepared materials of the Science Reading Program under the direction of an instructor.

A Reading Rate Student Answer Sheet and Graph was used to provide continuous data on the student's improvement and needs. See Exhibit 4. After completing each reading exercise, the student was asked to record the number of the passages read, and the answers to the comprehension questions. Together with the instructor, the student scored the answers and graphed the comprehension level obtained. Diagnosis appraisal indicating the kind of comprehension question missed was also recorded. The instructor then prescribed the next passage and rate for the student or directed the student to additional or follow-up skill development exercises.

During the last week of the term, The Nelson-Denny Reading Test, Form B was administered to all students. Comparisons of the scores on pre- and post-tests (Forms A and B of The Nelson-Denny Reading Test) provided a basis for evaluating the impact of the program on students in each of the 3 initial Reading Levels (I, II, and III) categories within the Active and Inactive Groups.

To facilitate the processing of the student data, a specially designed form was used. A summary sheet included: an identification number and major department for each student, a category classification describing the number of passages completed by the student, entry and culminating level codes, pre- and post-reading grade level scores and rate, Facts or Myths Inventory level scores, and the number of passages read. See Exhibit 6.

Exhibit 6 - Summary Data Sheet for Participants

1.	Identification Number for each student	1	2	3
2.	Active/Inactive (A or I) (Active more than 6 passages)	4		
3.	Entry level (1, 2, or 3) (Level I, II, or III)	5		
4.	Culminating Level (1, 2, or 3)	6		
5.	Scores			
	a) Pre-Reading Grade Level	7	8	9
	b) Post-Reading Grade Level	10	11	12
	c) Pre-Reading Rate	13	14	15
	d) Post-Reading Rate	16	17	18
	e) Number Right in Inventory	19	20	
	f) Number of passages Read	21	22	
6.	Major Department (Write letters designating department)	23	24	
	a) Nursing (N.U.)			
	b) Dental Hygiene			

TESTING INSTRUMENTS

Nelson-Denny Reading Test

Two forms of The Nelson-Denny (1960), a nationally-normed standardized reading test, were used to measure Reading Grade Levels of participants in the program.

The Nelson-Denny Reading Test is composed of a 100-item Vocabulary section and 36-item Reading Comprehension section, both of the traditional multiple-choice type. It is a timed test--10 minutes for the Vocabulary section and 20 minutes for the Comprehension section. There are alternate forms--"A" and "B"; Form A was used as a pre-test and Form B as a post-test.

This test's standardization procedure was made on the basis of school enrollment by region and community size within each region. A sample of 4,000 students of each grade level was structured according to the percentage of students by region and by types of institutions of higher education, i.e., junior colleges, technical schools. Buros (1965) has stated that there is little to criticize in the standardization of the test.

Based on the results of the pre-test, students were divided into 3 groups. Those students who scored between seventh and ninth grade reading levels were designated as Level I, those between tenth and twelfth grade reading levels as Level II and those above twelfth grade reading level as Level II.

Facts or Myths

The investigator, in cooperation with Irene Martin, faculty member of the Developmental Reading Department of New York City Community College, developed a series of True-False questions and 10 Facts or Myths for ascertaining student's information of reading skills. See Exhibit 7 for Facts or Myths Inventory. There are many misconceptions among community college students regarding components of reading which include factors of rate, degree of comprehension, eye regression, etc. It was intended that these 10 questions would provide information regarding the reading knowledge of the students while the accompanying cartoons would be motivational for a follow-up discussion. In this way an educational process for disseminating correct information was established. This served as a good foundation for determining realistic goals for the Science program.

The Facts or Myths Inventory included the following accompanying cartoons, for the 10 questions. The responses on the bottom of each cartoon served as a guideline for discussions in each of the classes. See Exhibit 8 for the first Fact or Myth. See Appendix for Facts or Myths, 2 through 10.

Exhibit 7

SURVEY: FACTS OR MYTHS INVENTORY

Read each statement and indicate whether it is a Fact (true statement) or Myth (belief which is not true).

__________ 1. Reading slowly is the best way to remember facts.

__________ 2. The average college student should be reading at 500 w.p.m.

__________ 3. The most important factor in being a good reader is to pronounce each word correctly.

__________ 4. A good vocabulary will help to increase your reading rate and level of comprehension.

__________ 5. Initial placement and ongoing progress reports are important for effective reading improvement.

__________ 6. Once you have achieved your goals for reading rate and comprehension you need not practice anymore.

__________ 7. Reading increasingly difficult materials will guarantee a rate increase.

__________ 8. Your eyes can be trained to see and read an entire page at a time.

__________ 9. It is possible to read a novel at the rate of 10,000 w.p.m.

__________ 10. Speed-reading machinery is essential if you want to quadruple your reading rate.

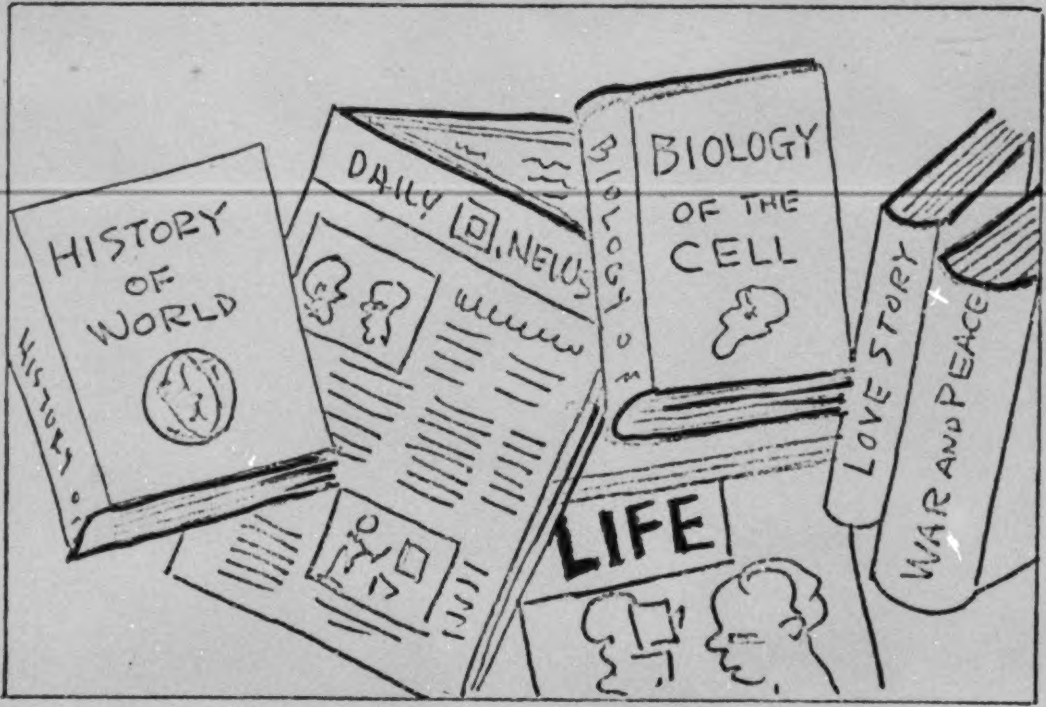
ANSWER KEY: 1) Myth 2) Myth 3) Myth 4) Fact 5) Fact
6) Fact 7) Myth 8) Myth 9) Myth 10) Myth

Exhibit 8

FACTS OR MYTHS ABOUT READING RATE

#1 FACT OR MYTH?

"All materials should be read slowly and deliberately for maximum retention."


HISTORY OF WORLD
HISTORY
DAILY NEWS
BIOLOGY OF THE CELL
BIOLOGY
LOVE STORY
WAR AND PEACE
LIFE

EXPLANATION

Often reading habits are formed which reflect the need to read technical materials at a slower rate for maximum recall. However, this may result in a consistent slow rate of reading for all types of materials. Your reading rate should be flexible and vary according to your purpose, interest level, and the degree of difficulty. Therefore, it is a MYTH that, "All materials should be read slowly and deliberately for maximum retention."

Chapter VI

RESULTS

This chapter presents a summary of the results of the statistical tests performed in the study. The data is presented by hypotheses. In evaluating the differential impact of the program on each of the 3 categories of initial Reading Grade Level I, II, and III within the Active and Inactive groups, the following statistical tools were used: t-tests, analysis of variance, chi square, and Pearson product-moment of correlation. (Procedures and tables were utilized from Elementary Statistics by Spence, J. and others (1968). A minimum level of significance of $p < .05$ was the established criteria for all tests. See Appendix I for all raw data and calculations relating to evaluation of this program.)

RELATIONSHIP BETWEEN READING GAIN AND INITIAL PLACEMENT

H_1: It is expected that there will be no significant difference between the mean gain in reading scores on the pre- and post-test as measured by the Nelson-Denny instrument for subjects separately classified as Active in Reading Levels I, II, and III.

Table 5

Summary of Analysis of Variance of Mean
Gain Raw Score on Nelson-Denny of Groups
I, II, and III

Source of Variation	SS	df	M.S.	F	Significance
Between groups	66.52	2	33.26	$\frac{33.26}{3.86}=8.62$	$P < .01$
Within groups	212.3	55	3.86		
Total	278.82	57			

The analysis of variance used to test hypothesis 1 clearly showsthat there is a difference between assigned category and subsequent improvement in reading scores for Active students. We are able to reject the hypothesis that the students in Line I, II, and III have the same mean gain in scores as measured by The Nelson-Denny Test.

RELATIONSHIP BETWEEN READING GAIN AND STUDENT PARTICIPATION

H_2: It is expected that there will be no significant difference between the mean gain in reading scores on the pre- and post-tests as measured by The Nelson-Denny instrument for subjects separately classified as Active in Reading Levels I, II, and III.

A t-test was used to test hypothesis number 2 and the data is shown in Table 6.

Table 6

Summary of the Mean Pre- and Post-Test Nelson-Denny Scores for Levels I, II, and III Classified as Active

Levels	n	Pre-test $\bar{X}$	Post-test $\bar{X}$	t	df	Significant
I	14	112.9/14= 8.06	149.7/14= 10.69	3.08	13	P .005
II	19	11.55	13.6	5.27	18	P .005
III	25	13.94	14.11	.52	24	not significant

For the subjects classified as Active, the pre-test means ranged from 8.06 to 13.94 while the post-test means ranged from 10.69 to 14.11. Active students in Level I and II showed a significant improvement from pre- to post-test means. Active students in category III showed no significant improvement. Subjects in category II showed the most dramatic improvement.

H_3: It is expected that there will be no significant difference between the mean gain in reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Inactive in Reading Levels I, II, and III.

Table 7

Summary of the Mean Pre- and Post-Test Nelson-Denny Scores for Groups I, II and III Classified as Inactive

Levels	n	Pre-test $\bar{X}$	Post-test $\bar{X}$	t	df	Significance
I	13	7.89	8.59	1.3	12	no
II	14	11.66	12.2	.76	13	no
III	15	13.9	13.9	.037	14	no

Similar data is displayed for the Inactive students in Table 7. Although pre-test scores for both groups of Active and Inactive subjects were similar (that was the basis for classification) post-test scores were lower in all categories for the Inactive students and no significant improvement in reading scores were shown for any of these Inactive categories.

H_4: It is expected that there will be no significant difference between the mean of reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for the combined data across all Reading Levels (I, II, and III).

Table 8

Summary of the Mean Pre- and Post-
Nelson-Denny Test Scores for All
Subjects as a Combined Group Across
All Reading Levels I, II, and III

	Combined Group	n	Pre $\bar{X}$	Post $\bar{X}$	t	df	Significance
Active	I,II,III	58	11.256	13.12	2.95	57	P .005
Inactive	I,II,III	42	11.3	11.7	.665	41	no

Table 8 is the combined data for the Active and Inactive groups. The t-test was used which analyzes the difference between 2 small sample means. Based on this table, we would have to reject the null hypothesis 4 for the Active group but not for the Inactive group since only the Active group showed a significant increase in reading scores.

RELATIONSHIP BETWEEN READING GAIN PARTICIPATION, AND INITIAL PLACEMENT

H_5: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for all Active subjects separately classified by Reading Levels I, II, and III.

Table 9

Correlation of Number of Passages Read with Improvement in Reading Scores as Measured by the Nelson-Denny Instrument for Active Students in Categories I, II, and III.

Level	r	df	P. 05
I	.55	13	significant
II	-.37	18	not significant
III	.14	24	not significant

Through the use of the Pearson product- moment correlation, illustrated in Table 9, the null hypothesis 5 is accepted for Reading Levels II and III. For level I, the number of passages read showed a positive correlation with improvement in reading scores. Therefore, the null hypothesis is rejected for category I which indicates a significant relationship between mean gain on pre- and post-reading scores with the number of passages read.

H_6: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for all Active subjects as a combined group across all Reading Levels I, II, and III.

Table 10

Correlation of Number of Passages Read with Improvement in Reading Scores as Measured by the Nelson-Denny Instrument for All Active Students

Category	r	df	P .05
I, II, III	.03	57	not significant

In reviewing the combined data prescribed in table 6, we learn that there is no significant correlation between the number of reading passages and mean reading gains for Active participants in categories I, II, and III combined. This was due to the negative correlation in category II and the low correlation index in category III. In addition, categories II and III had larger sample sizes than category I.

RELATIONSHIP BETWEEN INITIAL PLACEMENT AND STUDENT PERCEPTION

H_7: There will be no significant difference between Active students classified in Levels I, II, and III with regard to perceptions of *Facts or Myths Inventory*.

Table 11

Summary of Frequency Count for Chi
Square Calculations of Students
Scoring Less than 7, and 7 and Above
on the Facts or Myths Inventory for
Levels I, II, and III.

score	I	II	III	total n=58	%
over 7	3/5.32	5/7.22	14/9.5	22	.38
7 or less	11/8.68	14/11.78	11/15.5	36	.62

df = (r-1) (c-1) = 2

chi square = 6.17 which is significant
at p .05

Before examining hypothesis 7, a pass-fail score on the *Facts or Myths Inventory* needed to be established. A predetermined cut-off of 7 or less on the *Facts or Myths Inventory* was established prior to the analysis of the data. This delineating score was based on a survey of reading specialists who are members of the International Reading Association, Special Interest Group for Two Year colleges. They felt that a score of 8 would indicate a sufficient knowledge of reading skills necessary for adequate communication between participants and teacher regarding the principles inherent in Science Reading Program.

To examine hypothesis 7, a 2 x 3 chi square was employed. A chi-square test showed that the observed distribution of scores deviated from the expected. Level III students achieved higher scores than expected whereas students in Levels I and II achieved scores lower than expected.

Chapter VII

CONCLUSIONS AND IMPLICATIONS

ANALYSIS OF DATA

The Science Reading Program focuses on the immediate goals of preparing the students for a career which they have chosen. There are 3 factors which are central to this program. Motivation is a prime factor for maximizing interaction of the student to the material. Once a student is self-directed to the attainment of a goal, he perceives a relevance to the development of the appropriate skills. Another factor central to this program is the acquisition of high levels of comprehension which is accomplished through a format involving reading rate, giving the program a less prejorative stress. This third factor, reading rate, is always in relationship to a minimum standard of comprehension, it is easily translated into "speed reading," a skill which many successful professionals have acquired through training, thereby removing the stigma of remediation. Although this program uses a reading accelerator, which is a new experience for the adult learner at New York City Community College, it builds from this positive exposure to developing reading skills without the support of any mechanical devices. These 3 skills were conceived to undergird strong motivational responses responses for students who previously lacked academic success or who had not achieved their potential.

It is evident from an examination of the data collected relative to the stated hypothesis, that this program is operable.

Relationship Between Reading Gain and Initial Placement

Hypothesis 1 stated: It is expected that there will be no significant difference between the mean gain in reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Active in Reading Levels I, II, and III.

Through the analysis of variance it was demonstrated that a significant difference exists between the mean of the pre- and post-tests scores for all Active students categorized into Levels I, II, and III. Based on the sample population of students representing a wide range of entry reading abilities, there is evidence that those actively participating in the Science Reading Program will show an increase in reading scores as measured by the Nelson-Denny instrument.

It was demonstrated that success in the reading skills program is dependent upon the initial level in which a subject was placed as determined by the Nelson-Denny at the start of the program. A review of the test data indicates that students in Active Level II showed a stronger mean gain than those in Level I. It may be considered that students starting with stronger skills appear to benefit more from this type of program. Perhaps an additional preliminary component could be considered to assist students in Level I to progress into Level II before they start the Science Reading Program to further enhance the demonstrated significant reading gain for student in Level I.

Relationship Between Reading Gain and Student Participation

The statistical measure used to examine hypotheses 2, 3, and 4 was the t-test for correlated samples. This tool permits examination of the difference between two samples in order to determine if the difference is likely to be a chance or a real difference.

Hypothesis 2 stated: It is expected that there will be no significant difference between the mean gain of reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Active in Reading Levels I, II, and III.

This hypothesis was rejected for Active students separately classified in Levels I and II, but not for those Active students in Level III. Since group III was found to have no significant difference, this might indicate that the Science Reading Program was not effective in the case of these students. However, The Nelson-Denny Reading Test used in the study did not have a broad enough range to measure improvement for this group. The Nelson-Denny has a range from seventh to fourteenth grade. Some students classified into Level III on the pre-test achieved the maximum score and no further improvement could be demonstrated for the post-test.

Hypothesis 3 stated: It is expected that there will be no significant difference between the means of reading scores on the pre- and post-tests as measured by the Nelson-Denny instrument for subjects separately classified as Inactive in Reading Levels I, II, and III. The hypothesis was accepted for all separately classified Levels I, II, and III. This may substantiate the view that the lack of mean gain in reading was due to non-participation in the Science Reading Program. Often results of reading programs are confounded by the factor of maturation. However, those students classified as Inactive (read less than 6 passages) continued in the regular college curriculum and still evidenced no measured improvement in reading facilities.

Hypothesis 4 stated: It is expected that there will be no significant difference between the means of reading scores on the pre- and post-test as measured by the Nelson-Denny instrument for the combined data across all Reading Levels (I, II, III) separately classified as Active and Inactive.

This hypothesis was accepted for students classified as Inactive and rejected for students classified as Active across Levels I, II, and III. When examining all the data of the combined or separately classified students in groups I, II, and III, it is apparent that only active participation produced higher skills. Both Active (read 6 passages or more) or Inactive (read less than 6 passages) groups were enrolled in the college and exposed to assigned reading required by their curricula. The gain in the reading score may be attributed to the additional exposure to the Science Reading Program rather than a historical process due to enrollment at the college or to maturation.

Relationship Between Reading Gain, Participation, and Initial Placement

Hypothesis 5 stated: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for subjects.

This null hypothesis was accepted for those students separately classified in Levels II and III and not for those classified in Level I. Only for those students in Level I was there a significant direct correlation between number of passages read and reading level gain.

Hypothesis 6 stated: It is expected that there will be no significant correlation between the gain in pre- and post-test reading scores as measured by the Nelson-Denny instrument and the number of passages read for all Active subject as combined group across all Reading Levels I, II, and III.

This null hypothesis was accepted. The combined data (Table 8) showed that no significant relationship existed between number of passages read and mean reading score when all Active participants were grouped together.

Table 12 summarizes the number of passages read according to entry level reading abilities.

Table 12

Summary of average number of passages read for students separately classified in Levels I, II, III.

group	range	mean	n
1	6-21	17	14
II	7-33	16	19
III	7-35	19	25

Category I students demonstrated an improvement that was directly related to passages read. Level I students is the category presenting the minimum entry reading scores. It is indicated that students of this ability benefit significantly from repeated experience with this type of exercise. Although Active Level II students made the maximum reading gains, there was no significant relationship when comparing their mean reading gain with the number of passages read. This data may indicate that students in the lowest level optimally benefit from repetition of exercises which reinforce reading skills. Students in higher levels may not require as high a degree of exposure in order to achieve significant reading gains although all categories indicate a mean gain. Consideration might be given to establishing a minimum number of passages to be read specific to each level. Students would then be encouraged to read above this established number. It may be that adult students have a realistic self-concept and read more or less as dictated by their individual perceptions of needs and abilities.

Hypothesis 7 stated: There will be no significant difference between Active students classified in Levels I, II, and III with regard to perceptions of Facts or Myths Inventory. Apparently students who read well have greater knowledge of the facts related to reading. This may be significant in relation to a student's development in reading and suggests an area for further study. It is possible that removing the mystique of reading through a thorough exploration of the terminology and processes related to the instrument of reading prior to the start of the program will result in an improvement of these skills.

SUMMARY RESULTS

One hundred students enrolled in the Division of Allied Health participated for one semester in a specifically designed Science Reading Program. Analysis of data suggests that a structured high interest instructional reading program can produce a significant result in one semester. The results of this study, as follows, suggests that creating an appropriate environment condusive to learning does result in significant gains.

Both the control group and the experimental group shared the motivating factor of achieving a 12th grade Reading Level prior to admission into the career curricula. It should be noted that the positive results for the Active participants in the Science Reading Program indicate that the effect of motivation as reinforcement for the adult learner may have been a significant contributing factor in this study.

1. Active participation in the program results in mean reading gain for all students classified in Level I (initial reading grades 7-9), Level II (initial reading grades 10-12), Level III (initial reading grades above 12).

2. Of all participants (six passages or more) those students who read at Reading Level II (ten to twelfth Reading Level) achieved the most pronounced mean reading gain. Although students who read at Level I & II also showed materiable gains.

3. There was a demonstrated relationship between the number of passages read and the mean reading gain for those participants who initially read between Grade Levels seven and nine (Level I).

4. For those students who read initially at above tenth grade Reading Level, there was no significant relationship between mean reading gain and the number of passages read.

5. Students who had scored at the highest reading level achieved a higher score on the Facts or Myths Inventory measuring knowledge about reading.

PROJECTION FOR FUTURE STUDY

The following are suggestions for areas to be considered for further research:

1. Attend to utilizing or developing a better instrument for measuring reading improvement. The nationally accepted Nelson-Denny Reading test is not adequate for asertaining the effectiveness of the Science Reading Program for Level III students as it was for Level I and II.

2. Establish through statistical analysis a required minimum number of reading passages specific to each level. The relationship between a peak number of reading passages and reading gains may be determined in order to optimize reading gains.

3. Conduct follow-up studies at six months and one year intervals to determine the extent to which reading rate is maintained and level of comprehension remains stable, increases or decreases.

4. Determine whether students who show significant mean reading improvement achieve higher grade point averages, and grades in science courses requiring extensive reading, than students who show no significant improvement.

5. Replicate the study with sample population drawn from students within the five different departments within the Division of Allied Health and Natural Sciences. This study could be undertaken in non-science curricula field environments at New York City Community College.

6. Replicate the study at comparable urban community colleges to New York City Community College. It would enhance the study to have taken into account the same types of data collected in different types of community colleges, suburban, rural, private, and smaller institutional settings.

7. Evaluate the effectiveness of the Science Reading Program through correlation between final placement in Levels I, II, and III achievement in reading and the student's college grade point average and/or grades in science courses requiring extensive reading.

8. Establish a more detailed profile of students' reading abilities through items analysis of the ten comprehensive questions of the base reading passage than the broad classification of Levels I, II, and III. Additional supplementary activities could be developed within each level related to differentiated student needs within each level which may insure greater success in the program.

Analysis of the reading process is required in order to determine the reader's task and the instructional requirements more clearly. Teachers need to know when, where and to what extent a unit of instruction is effective. It is this kind of information teachers must have and are beginning to rely on from researchers. Educators must be encouraged to explore one's questions, form expectations of ideas to come, correct interpretations when the expected does not occur, and proceed with new predictions if they are to find real answers to instructional problems. Educators must be encouraged to assume educational accountability which is the responsibility to investigate the nature of the product achieved as related to clearly defined instructional and institutional objectives.

In this era of accountability the effectiveness of innovative reading programs must be validated by qualified statistics. This is particularly true in our present climate where budgetary pressure may cause amputation of entire areas of ancillary instruction. The administration needs a basis for decision-making and must be thoroughly appraised of the impact of on-going programs. In order to substantiate budget commitments, administrators must be provided with appropriate support data so that the bases for these decisions are visible.

For the academic year 1975, procedures were formalized for putting into practice, on an experimental basis, a Professional Learning Skills Program.

In a memorandum, the Dean of Faculty has charged the chairperson of the Curriculum Committee of New York City Community College with the responsibility of reviewing procedures, materials, and the results of this course of study.

A sub-committee was created with representation consisting of 2 content faculty members from the Division of Allied Health, the author of this study, and the chairperson of Developmental Skills at the College. Evaluation procedures and subsequent analysis of data, detailed previously in this study, will be reported to this committee. Based on these findings, this course may become a continuing course offering at the College and serve as a model for other career-oriented Learning Skills programs.

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APPENDICES

APPENDIX A

APPLICATION COVER SHEET

(x)Grant 117
( )Contract

1. Submitted to: Agency: New York City Community College

   Address: 300 Jay Street Brooklyn, N.Y. 11201

2. Proposal Title: Allied Health Professional Learning Skills Program

3. Principal* Investigator(s): 1) Dean August A. Tuosto
   Name
   Signature
   ~~Division of Allied Health~~ Assoc. Dean 076-24-0034
   Department Rank Social Security #

   2) Lorraine Beitler
   Name
   Signature
   Developmental Skills Ass't, Prof. 065-22-8267
   Department Rank Social Security #

4. ( )New ( )Continuation of #______ ( )Renewal of #______
   (X)Extension of #______ ( )Revision of #______

5. Type of Project:

___ Research	___ Training - Institute - Conference
x Demonstration	___ Career Development Award
___ Planning	___ Institutional Award
___ Program Development	___ Equipment
___ Other ______ (Identify)	

6. Program Code Number** (Catalogue of Federal Domestic Assistance) 13.304

7. Project Period: From 7/1/75 Through 6/30/77

8. $ Requested: Total Costs $68,550 (1st 12 months) $123,500 (Total)

   Indirect Costs 8% (1st 12 months) ______ (Total) @______of______

9. Applicant Organizations:

   (a) The New York City Community College
   of the City University of New York
   300 Jay ST
   Address
   Brooklyn NY 11201

   (c) Richard Greenfield
   College Representative
   Richard Greenfield
   Signature

   Jointly with
   (b) The Research Foundation
   of the City University of New York
   IRS No. 13-1988190 E.
   PHS No. 73-2337
   1411 Broadway
   New York, N. Y. 10018 C.D. 17

   (d) Arnold Dimond
   Research Foundation Representative
   Arnold Dimond
   Signature

10. Fiscal Agent: Mr. Paul Segall, Controller
    Research Foundation of the City University of New York
    1411 Broadway, New York, N. Y. 10018

11. Date of Submission: March 12, 1975

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*If more than 2 Principal Investigators, all information on separate sheet and attach.

**Federal Programs only.

RRF500-6/74

APPENDIX B

NEW YORK CITY COMMUNITY COLLEGE

INTER-OFFICE MEMORANDUM

DATE: June 4th, 1975

TO: Dr. H. Dunbar, Chairman
Curriculum Committee

FROM: Dean of Faculty

SUBJECT: Experimental Course: Reading for Allied Health Students

Through our discussions and those held with both the staffs of the Allied Health Learning Center and Developmental Reading, the attached joint proposal is being made as an experimental course for the 1975-76 academic year.

The proposed course, AH/DR 012 - Reading for Allied Health Students, combines the efforts of these two instructional areas in support of reading development in a specific skill area, Allied Health, where the need is great. The course has my permission to run, experimentally, for both the Fall 1975 and Spring 1976 semesters. At a close of this coming academic year, we will receive a complete report on the success and viability of such a course which will help us determine our future plans in this area.

Mario J. Iraggi

Attachments:

cc: Prof. L. Beitler
Dean H. Dunbar
Prof. M. Graber
Prof. J. Hawes
Dean A. Tuosto
Ms. W. Needleman
Mr. J. Ryan

APPENDIX C

New York City Community College
OF THE CITY UNIVERSITY OF NEW YORK, 300 JAY STREET, BROOKLYN, N.Y. 11201

June 25, 1975

Dr. John Scigliano
Director of
ED. D. Program for Community Colleges
Nova University
Ft. Lauderdale, Florida 33314

Dear Dr. Scigliano:

Freshman admits to New York City Community College often have not acquired the prerequisite skills necessary for survival in the college academic program. In order for these students to benefit from the increased opportunities of access to post secondary education they must develop basic educational skills. The concept of a program focusing on the application of reading and study skills and science materials has been conceived by Prof. Lorraine Beitler.

It is the concerted opinion of faculty members of the College Curriculum Committee as well as the Faculty Council of New York City Community College that this program be implemented. Procedures have been formalized for students in the Division of Allied Health to be enrolled in this course of study in September 1975.

It is anticipated that if this course is successful its application will be generalized through the Division in the college.

Very truly yours,

Mario J. Iraggi
Dean of Faculty

MJI:ts

New York City Community College

OF THE CITY UNIVERSITY OF NEW YORK · 300 JAY STREET, BROOKLYN, N.Y. 11201

July 11, 1975

Dr. John Scigliano
Director, ED. D. Program for Community Colleges
Nova University
Ft. Lauderdale, Florida, 33314

Dear Dr. Scigliano:

Re: Lorraine Beitler

Approximately 1700 students are enrolled in the Division of Allied Health at New York City Community College. Performance on standardized tests indicate that many have not acquired the pre-requisite reading skills necessary to complete the college science curricula, licensure and/ or certification examinations.

A Learning Center coordinated by Prof. L. Beitler has been developed to help better prepare students to experience success in the career educational program of their choice. One of the activities of the Center includes an innovative reading program which will build on the motivation of student interest in developing reading and study skills through the use of science materials. The results of this study, evaluating the impact of this program, will be forwarded to a faculty committee which has been appointed to serve as a liason of this experimental program to the Faculty Council of New York City Community College. Based on their recommendation, this course may become a continuing curriculum offering at the college and may serve as a model for other career-oriented reading programs.

Very truly yours,

August A. Tuosto
Associate Dean of Faculty and/
Division Chairman of Allied Health
and Natural Sciences

AAT:dd

cc: L. Beitler

New York City Community College of Applied Arts and Sciences is Administered by the Board of Higher Education of the City of New York under the program of the State University of New York

New York City Community College
OF THE CITY UNIVERSITY OF NEW YORK, 300 JAY STREET, BROOKLYN, N.Y. 11201

June 26, 1975

Dr. John Scigliano, Director
Ed.D Program for Community College
Nova University
Fort Lauderdale, Florida 33314

Dear Dr. Scigliano:

The Learning Center concept as it is emerging at New York City Community College is an outgrowth, in part, of an earlier pilot project of Professor Lorraine Beitler. It is of great importance that its institutional development be designed, administered, monitored and evaluated by her.

The administration of the College fully supports Professor Beitler's efforts in the development of the Allied Health Learning Center.

Very truly yours,

Richard Greenfield
Richard M. Greenfield
Executive Assistant to
the President

RMG:es

APPENDIX D

DIRECTIONS FOR DETERMINING READING GRADE LEVEL USING THE "SMOG" FORMULA

Directions:

1. Count 10 consecutive sentences near the beginning of the text to be assessed. Ten in the middle and 10 near the end. Count as a sentence any string of words ending with a period, question mark or exclamation point.

2. In the 30 selected sentences count every word of three or more syllables. Any string of letters or numerals beginning and ending with a space or punctuation mark should be counted if you can distinguish at least three syllables when you read it aloud in context. If a polysyllable word is repearted, count each repetition.

3. Estimate the square root of the number of poysyllabic words counted. This is done by taking the square root of the nearest perfect square. For example, if the count is 95, the nearest perfect square is 100, which yields a square root of 10. If the count lies roughly between two perfect squares. Choose the lower number. For Instance, If the count is 110, take the square root of 100 rather than that of 121.

4. Add 3 to the approximate square root. This gives the SMOG Grade, which is the reading grade that a person must have reached if he is to understand fully the text assessed.

APPENDIX E

PROFESSIONAL LEARNING SKILLS PROGRAM

A MODEL OF SYSTEMS FOR LEARNING WITH APPLICATION TO CURRICULA

This has been excerpted from
materials developed by the
Allied Health Learning Center
supported by the

DEPARTMENT OF HEALTH, EDUCATION AND
WELFARE GRANT # D01 - AH 10078-02

NEW YORK CITY COMMUNITY COLLEGE
BROOKLYN, NEW YORK 11201

JUNE 1975

PROFESSIONAL LEARNING SKILLS PROGRAM FOR ALLIED HEALTH STUDENTS

INDIVIDUALIZED INSTRUCTION IN THE OPEN LABORATORY

I. Introduction
  A. Procedures
    1. For borrowing equipment
    2. For maintaining individual student records
  B. Establishment of individual goals for the development of professional learning skills.

Instructional Objectives:

1. Each student will submit an outline listing the open laboratory procedures with 100% accuracy.
2. Each student will submit a listing of individual goals for the development of professional learning skills.

II. Establishing Initial Reading Rate Level
  A. Determination of individual reading rates, using reading passages assigned according to each student's base reading grade level.
  B. Discussion procedures for determining and recording reading rate and comprehension level

Instructional Objectives:

1. Given a reading passage and appropriate instruction each student will determine base reading rate with 100% accuracy.
2. Each student will determine, record, and draw a bar graph of their reading comprehension level with 100% accuracy.

III. Use of Reading Accelerator
  A. Demonstration of the use of the reading accelerator
    1. Functions
    2. Parts
    3. Maintenance
  B. Discussion of word count graph
  C. Practice with reading accelerator and word count graph.

Instructional Objectives: (III)

1. Given 5 reading passages, the student will be able to use the conversion table to determine the appropriate reading rate setting to be used on the accelerator with 100% accuracy.
2. Given increased reading rates, the student will be able to readjust the dial on the accelerator to accommodate increases in reading rate with 100% accuracy.

IV. Increasing Reading Rate and Comprehension Using Science Materials
   A. Science and Medical reading passages at three levels (7-9, 10-12, 13-15+) of readability with comprehension questions used with the reading accelerator.
   B. Timed reading passages
   C. Reading skill exercises
      1. Locating main idea
      2. Finding supporting detail
      3. Identifying vocabulary in context
      4. Drawing conclusions

Instructional Objectives:

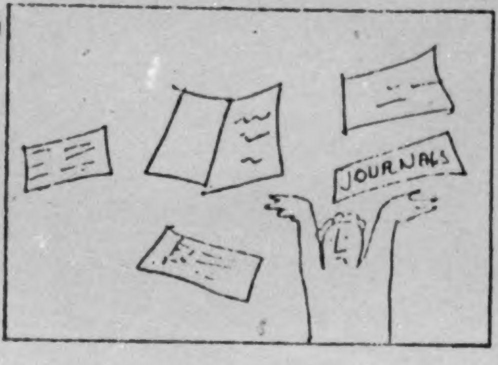
1. Given a series of scientific reading materials and practice exercises, the student will increase his rate of reading to a minimum of 50 words per minute above his initial reading rate.
2. Given a series of reading skill exercises, the student will answer questions with 80% accuracy on:
   A. Locating the main idea
   B. Finding supporting detail
   C. Identifying vocabulary in context
   D. Drawing conclusions
3. Given a chart for recording student progress, the student will be able to:
   A. Record reading rates and levels of comprehension with 100% accuracy.
   B. Diagnose the errors made in comprehension, referring to a predetermined code with 100% accuracy.
   C. Shade in portion of the chart to indicate progress made with 100% accuracy.

APPENDIX F

A PROGRAM FOR MORE EFFECTIVE READING IN SCIENCE:
PART ONE -- ESTABLISHING BASELINE DATA

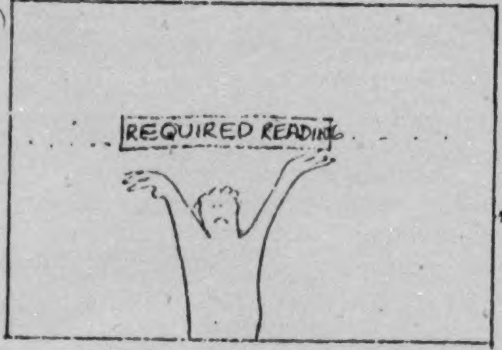
Has the printed word got you down? Do you find you are reading more and remembering less? Regardless of your career choice, you must have good reading skills in order to keep up with the growing amounts of reading assigned to you. Students at the college level often spend as much as 90% of their study time reading.

(1.)



This includes required readings for your course work, which involves completing textbook assignments.....

(2)



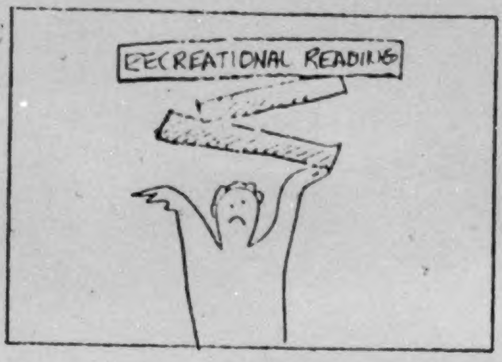
and research using professional journals and library references.

(3)

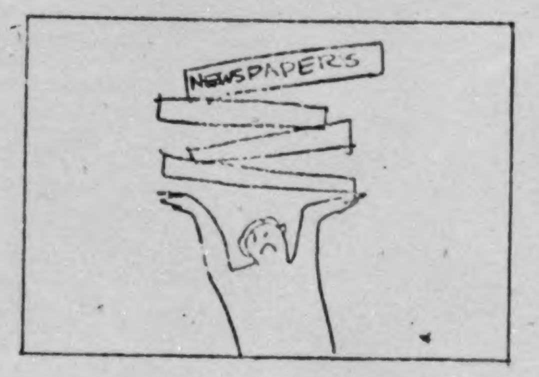
JOURNALS AND LIBRARY REFERENCES

2

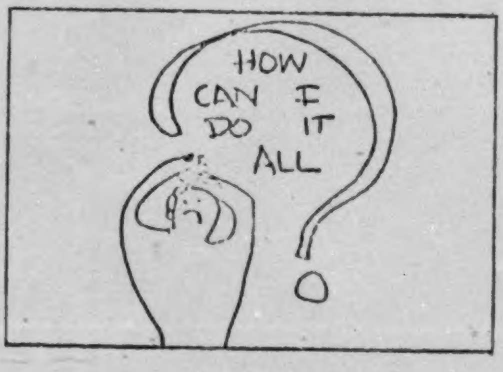
In addition there is recreational reading in novels and magazines.


RECREATIONAL READING

- And the need to keep up with current events in the newspaper.

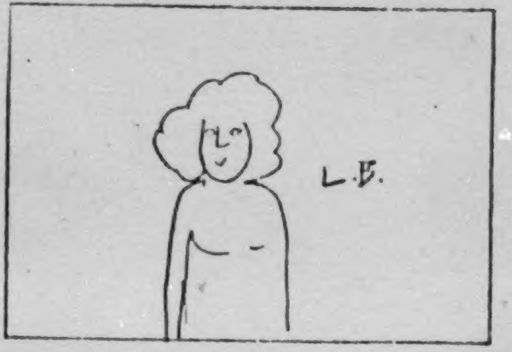

NEWSPAPERS

How can I do it all?

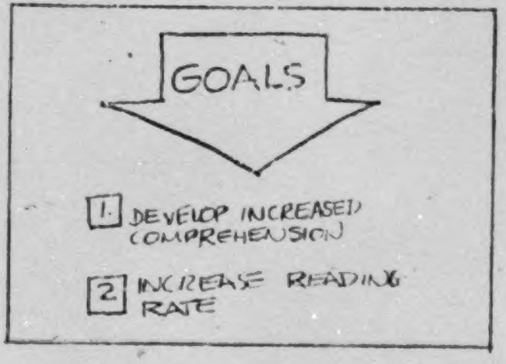

HOW CAN I DO IT ALL

3

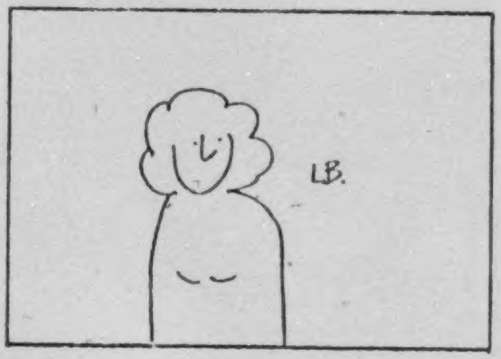
This video presentation is your introduction to an individualized reading program.



The goals of the program are to develop increased comprehension, or understanding, of science materials with an increase in reading rate.


GOALS
1. DEVELOP INCREASED COMPREHENSION
2 INCREASE READING RATE

If you are determined to improve your reading habits, the skills you learn in this program can be applied to other college programs as well. The ability to read efficiently is the key to success in school and the professional world. To be successful in your occupation, you must devote a considerable percentage of the day reading. Remember, your own attitude in utilizing this program is most important.



4

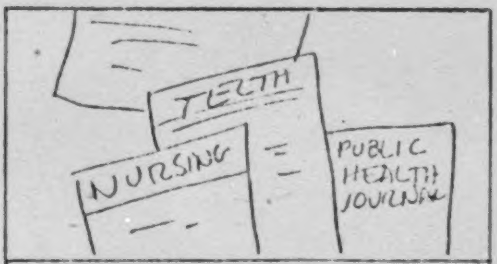
Success in the Allied Health professions requires a specific level of reading skills in order to learn difficult science concepts and specific details from your textbooks.

LEARNING CONCEPTS FROM TEXTBOOKS

- There is a need to follow complex procedures from laboratory manuals and clinical procedures. These involve many sequenced steps, requiring precise reading and understanding.

FOLLOWING CLINICAL PROCEDURES

There is a need to keep up with new practices and developments in your professional career which are published in journals, magazines, and technical reports.



KEEPING UP WITH CURRENT PRACTICES

5

This ever increasing volume of reading material which you are required to know presents the challenge:

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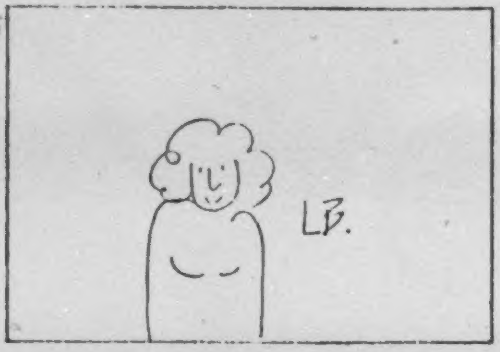
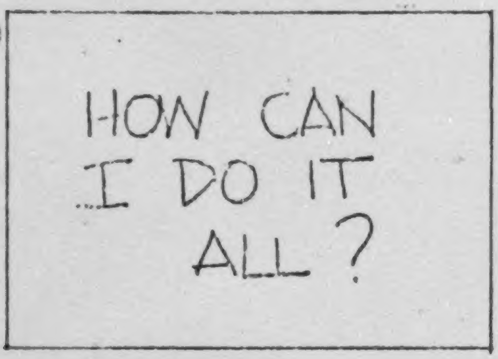


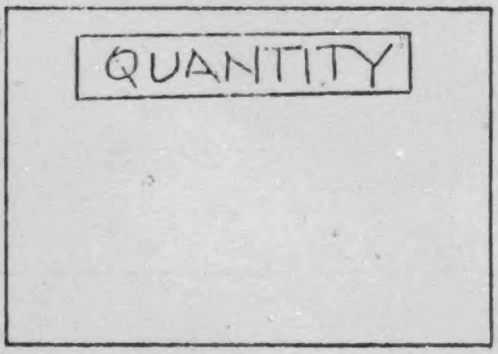
HOW CAN I DO IT ALL?

(14)


HOW CAN I DO IT ALL?

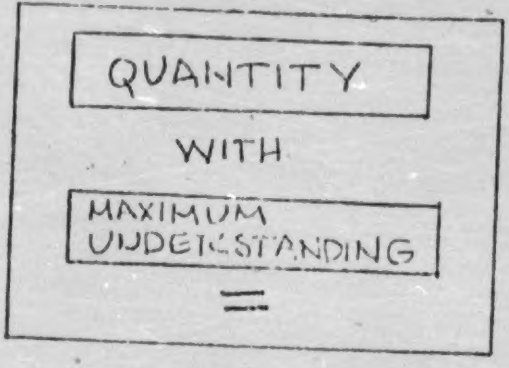
How can I read this quantity of material...

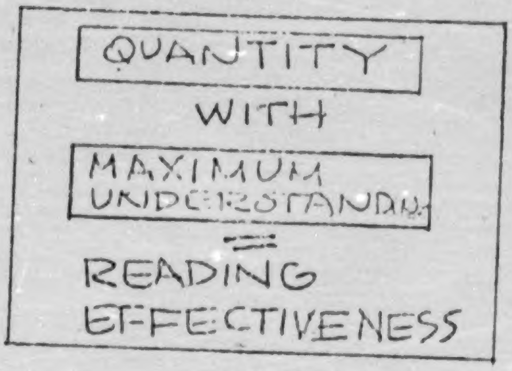
(15)



6

with maximum understanding. . . .


QUANTITY
WITH
MAXIMUM UNDERSTANDING
=


QUANTITY
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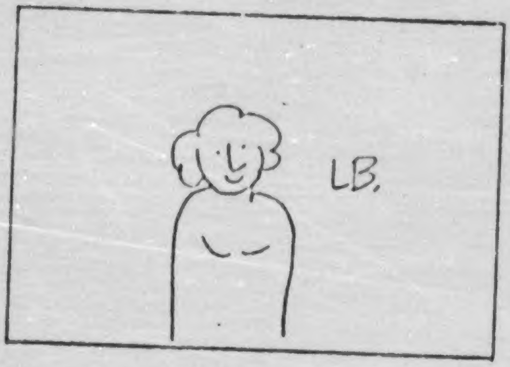
READING EFFECTIVENESS

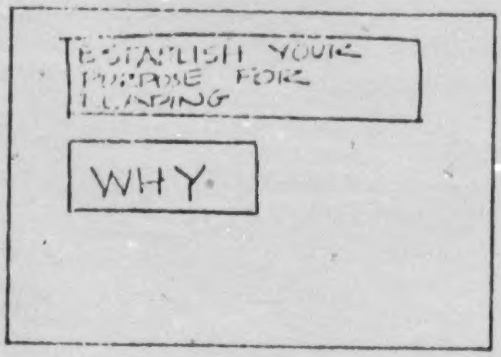
How Can I Improve My Reading Effectiveness?



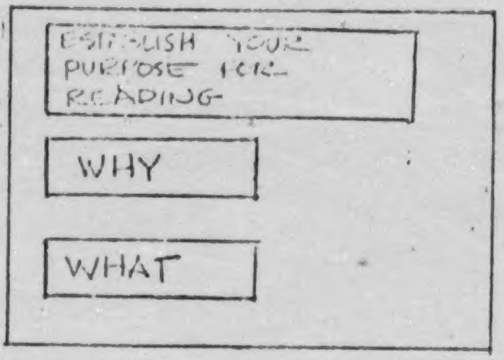
Our goal is to develop reading effectiveness. Let's start to meet this challenge. . .

7

You should establish your purpose for reading by: First, deciding exactly WHY you are reading the material. Is it for a course, for learning a hospital procedure, or for recreation?


ESTABLISH YOUR PURPOSE FOR READING
WHY

Second, you must determine WHAT you expect to learn from the reading material (i.e.): Technical vocabulary, scientific concepts, historical background.


ESTABLISH YOUR PURPOSE FOR READING
WHY
WHAT

Technical, scientific material must be read more slowly than recreational literature.

8

Do you know that most college freshmen read general material at 250 words per minute?

COLLEGE FRESHMAN

READ GENERAL MATERIAL AT

250 WORDS PER MINUTE

Do you know how fast you read?

WHAT IS YOUR

READING RATE

?

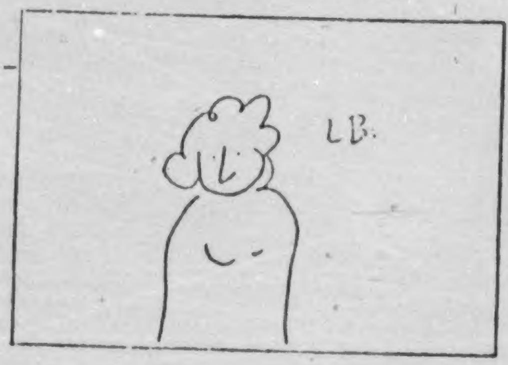
Your reading rate can be defined as the speed at which you understand the material measured in words per minute.

YOUR READING RATE:

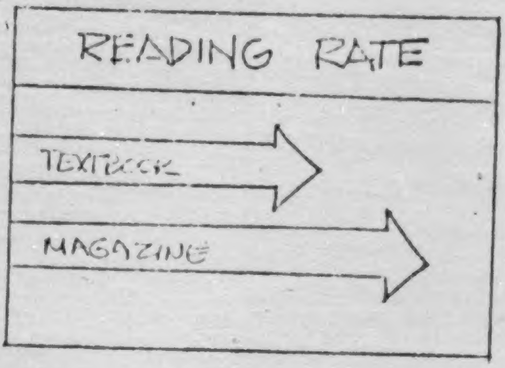
THE SPEED AT WHICH YOU UNDERSTAND THE MATERIAL MEASURED IN WORDS PER MINUTE.

9

During this session, you will determine your own reading rate, which differs with the material you read. Let's look at this chart.



Reading difficult study material from a textbook requires a slow reading rate. Reading for pleasure, a novel or magazine, on the other hand, which requires far less recall and understanding, can be accomplished at a much faster rate.



When reading, you should be able to adjust your reading rate according to the nature of the material, and your purposes for reading it.

10

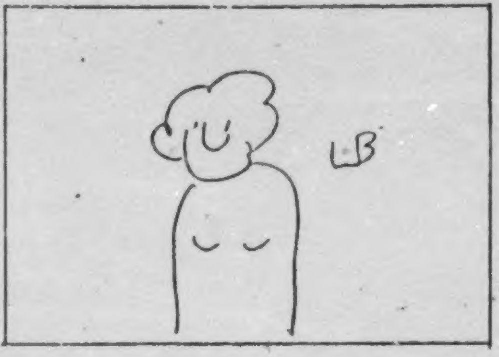
To sum up: Effective reading requires knowing your purpose for reading and then maximizing your comprehension and rate to suit that purpose.

EFFECTIVE READING

1 KNOWING YOUR PURPOSE

2 MAXIMUM COMPREHENSION AND READING RATE

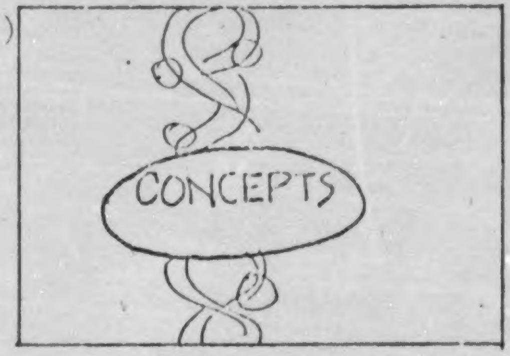
I must caution you. Many people have the impression that the most important phase of reading is the speed of reading. Actually the most important phase is understanding what you read in relation to your purpose. In fact, unless you understand what you read, in terms of your goals, you are not reading effectively. This program focuses on studying science materials.



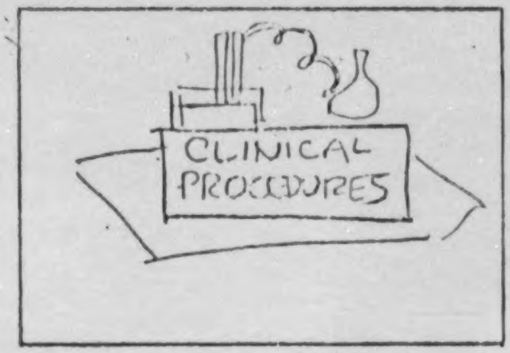
11

Science study requires a minimum of 70% to 100% understanding. A lesson in one of your curriculum courses might demand that you comprehend all of the material in your textbook, so that you can master the assignment.

Let us examine the Nature of Science Reading, which includes the understanding of concepts, . .



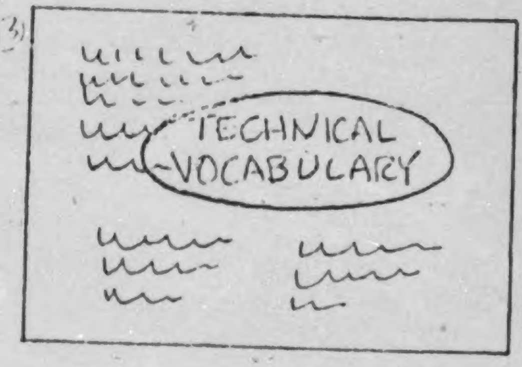
Clinical Procedures, . .



⟨12⟩

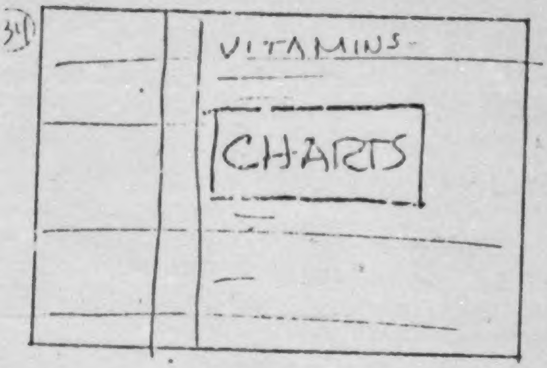
The acquiring of a new technical vocabulary.

33)


TECHNICAL
VOCABULARY

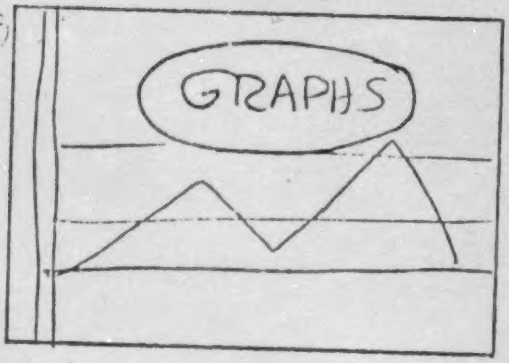
The interpretation of charts...

34)


VITAMINS
CHARTS

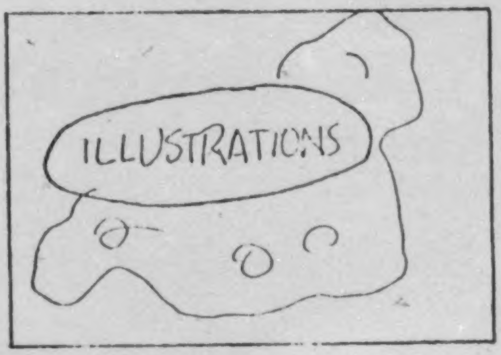
and Biostatistical graphs. Both of which are used extensively in science textbooks and journals.

5)

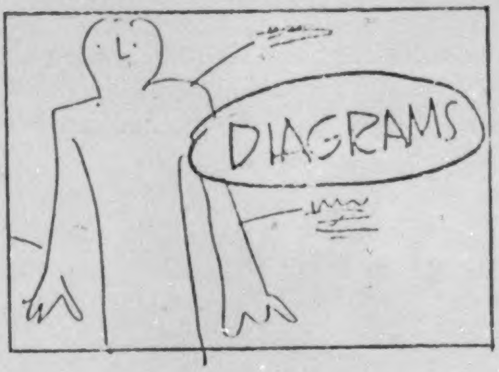


13

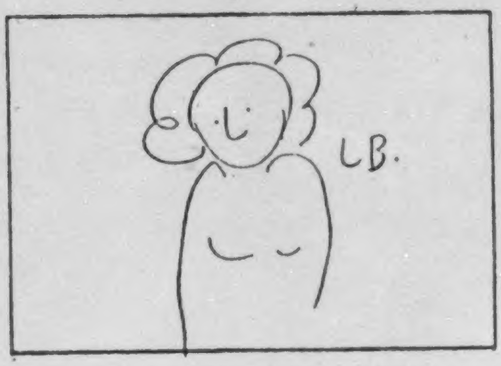
Illustrations which reinforce the reading material and highlight important technical data.



Diagrams which often are the best way for describing technical processes and showing the relationship of systems.



We can see that Science reading is made up of a variety of materials that cover a broad range of styles and formats. Now that you understand what an effective science reading skill requires, one asks the question:



14

How Can I Achieve an Effective Reading Skill? This is the goal of this program.

HOW CAN I
ACHIEV AN
EFFECTIVE
READING SKILL

These are the steps we'll be following:

1. WHERE ARE YOU NOW?
This is your present reading rate and reading grade level.
2: WHAT ARE YOUR GOALS?
This means the increase of your reading rate and comprehension to Effective College Reading Levels.
3. HOW DO WE GET THERE?
This involves the procedures, the materials, and the equipment used in the program.

1 WHERE ARE YOU NOW
2 WHAT ARE YOUR GOALS
3 HOW DO WE GET THERE

15

The purpose of this video module is to help you find WHERE YOU ARE NOW. In order to do this, we need to find your baseline data.

This includes:
1. Your reading grade level
2. Your reading rate
3. Your reading comprehension

BASELINE DATA

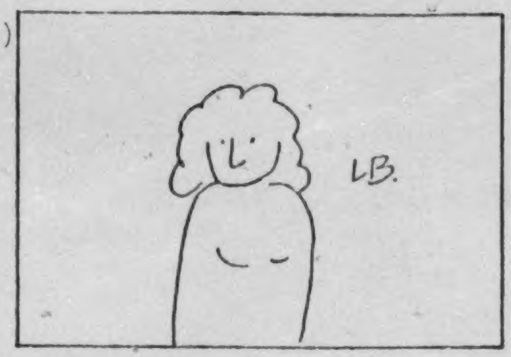
1. YOUR READING GRADE LEVEL
2. YOUR READING RATE
3. YOUR READING COMPREHENSION

—NOW—

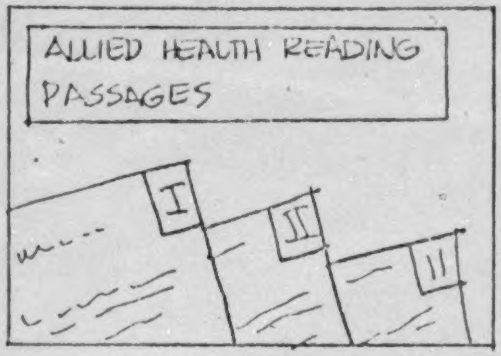
This is important so that you can measure your progress as your proceed through the program.

16

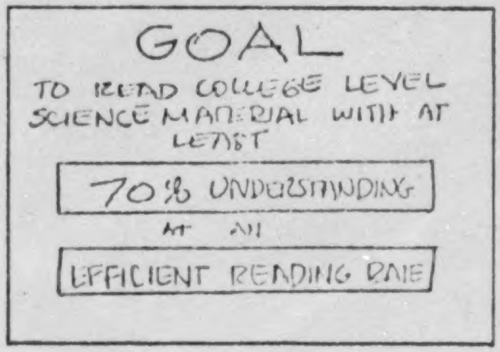
Let's examine the materials and equipment we'll be using in this program.



1. There are Allied Health reading passages. These are written on various levels of difficulty and on topics of interest to your curriculum. After you've established your baseline data, the instructor will direct you to appropriate passages. As you improve, the passages become increasingly more difficult.

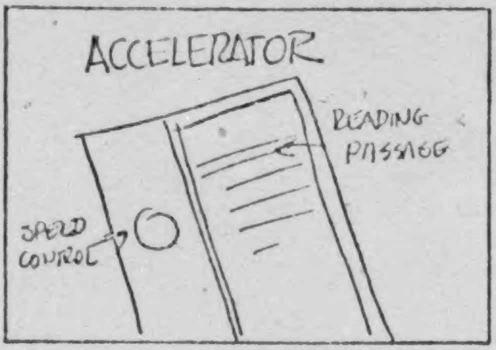

ALLIED HEALTH READING PASSAGES
I
II
II

Your goal will be to read college level science material with at least 70% understanding at an efficient reading rate.

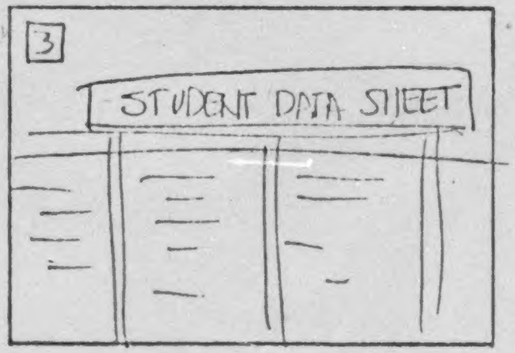

GOAL
TO READ COLLEGE LEVEL SCIENCE MATERIAL WITH AT LEAST
70% UNDERSTANDING
AT AN
EFFICIENT READING RATE

17

2. You will be using a Reading Accelerator. This device paces your reading speed, allowing you to slowly increase your reading rate until you are reading more efficiently. From time to time, your reading rate progress will be evaluated by using passages without the assistance of the accelerator to avoid dependance on a mechanical device.


ACCELERATOR
READING PASSAGE
SPEED CONTROL

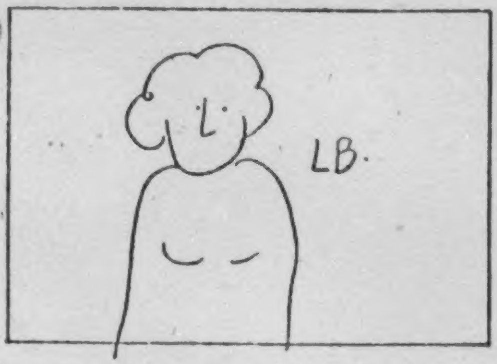
3. An individual diagnostic data sheet which permits you and your instructor to analyze your reading improvement is included.


3
STUDENT DATA SHEET

18

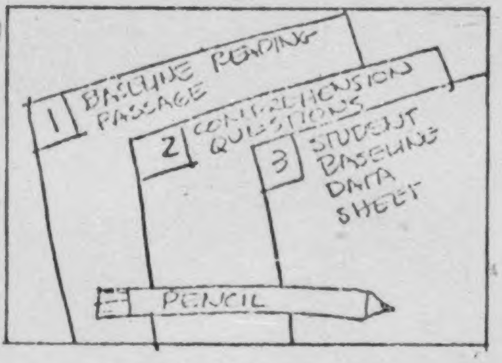
You have been given a packet of materials to go along with this video module. Let's check this together. The packet contains a:

9)



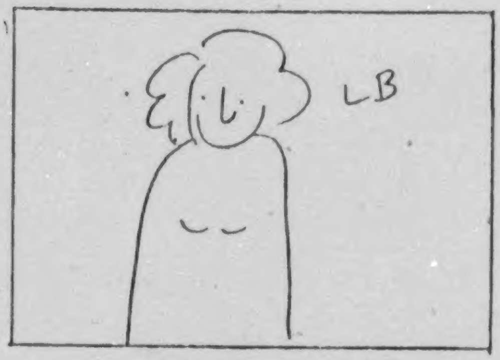
1. Baseline Reading Passage appropriate to your reading level.
2. Ten comprehension questions -- to evaluate your understanding of the passage.
3. Student Baseline Data Sheet which is used to record your reading rate and answers to the comprehension questions.
4. You will also need a pen or a pencil.

0)

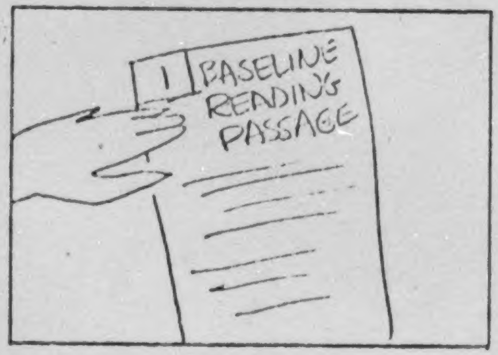

1 BASELINE READING PASSAGE
2 COMPREHENSION QUESTIONS
3 STUDENT BASELINE DATA SHEET
PENCIL

We are now ready for the Determination of Your Base Reading Rate and Comprehension level on scientific reading material.

We will first review the steps together, and then you will have the opportunity to determine your baseline data by performing these activities at the conclusion of the tape. This is just a demonstration, but follow the details carefully.

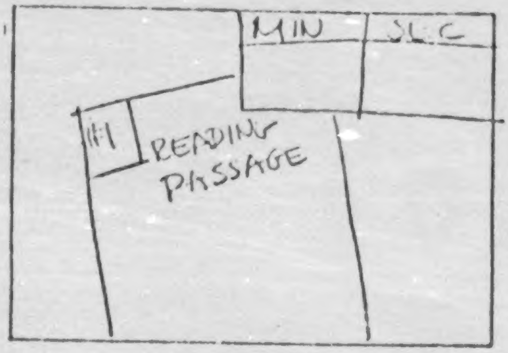


In order to determine your base reading rate, you will have to time how long it takes you to read this Pssg. -- (hold up sheet)

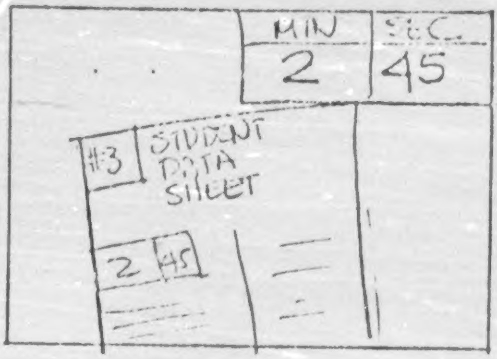


20

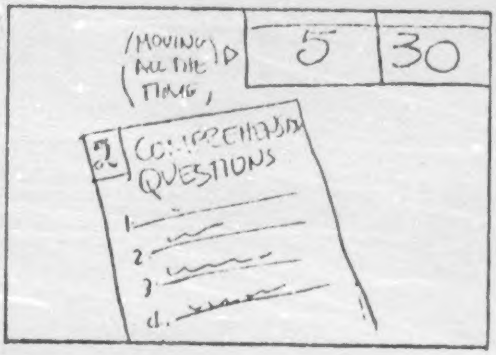
As you are reading the passage on the screen a clock will be timing how long it takes you to complete the reading. When you have finished reading the passage, look up at the screen and record the elapsed time on this Student Baseline Data Sheet - Sheet #4 (hold up)


MIN
SEC
#1
READING PASSAGE

For example, a student completed the passage in 4:15. She looked at the clock and recorded this time 4 mn, 15 secs. on the Data Sheet, in the designated space. (monitor)

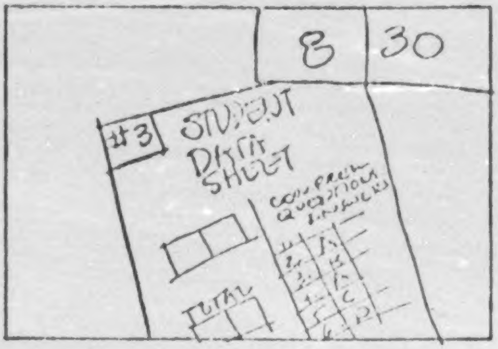

MIN
SEC.
2
45
#3
STUDENT DATA SHEET
2
45

At this point, you proceed immediately to the comprehension questions -- Sheet #2. Answer all ten questions by recording your choices as shown here.


(MOVING ALL THE TIME)
5
30
2
COMPREHENSION QUESTIONS
1.
2.
3.
4.

21

After answering all the questions, you will once again look up at the clock and record the total time elapsed. This student completed the reading passage and comprehension questions in 9 min. and 30 sec. which must be recorded again in the designated space.



Finally, bring the packet of materials back to the instructor, who will discuss with you, your base level reading rate and comprehension level.

Now you have an opportunity to perform these activities on your own. These are the steps you will follow:

1. Read the Base Level Pssg.
2. Record your Rdg. time.
3. Answer the 10 comp. ques.
4. Record the total time.
5. Find your reading rate
6. Take all of your materials to the instructor.

STEPS TO FOLLOW

1. READ BASE LEVEL PASSAGE
2. RECORD YOUR READING TIME
3. ANSWER 10 COMPREHENSION QUESTIONS
4. RECORD THE TOTAL TIME
5. FIND YOUR READING RATE
6. TAKE ALL OF THE MATERIALS TO THE INSTRUCTOR.

APPENDIX G

Base Level Reading Passage - Level I

One of the biggest medical events of the 1960's was the worldwide introduction and use of the Pill. About 8.5 million women in the U.S. use birth control pills. The basic feature of the Pill is its ability to act like the processes which result from pregnancy. They prevent ovulation. This is the release of eggs by the ovary, which ceases at the start of pregnancy because of these changes. This same result can be produced by a number of steroids. Some of these can have the same effect when taken by mouth. How these steroids work, and their long-term effects are not known in detail.

The active parts of the Pill are the hormones progestrone and estrogen, or their products.

Do these pills cause cancer? After the first 10 years of usage there were no facts to show that the Pill causes cancer. Nor was it shown that they cause diabetes, sterility, eye problems, mental illness, or any of a number of other problems to which they have been linked by critics. Since the time it takes for cancer to develop is thought to range from 10 to 20 years, it seems likely that if the Pill does not cause cancer, this will be shown during the 1970's.

There is one serious problem that has been linked with the Pill: thromboembolic (blood clotting) disease. These blood clots may be lethal. If they block a major blood vessel in a limb, amputation may be necessary. If they block a vessel to the lungs or grain, death may result. Studies done in Great Britain and the U.S. show that blood clotting is the cause of about 3 deaths per 100,000 users each year. Figures showed that this risk was less than the risk of blood clotting which would occur for the number of pregnancies that were stopped. But because there is a danger, all women who use the Pill should have checkups at least once every 6 months.

SOURCE: John Netterville, et al, Chemistry, Man, and Society, Philadelphia: W.B. Saunders Company, 1972, 523-3

Base Level Reading Passage-Level II

One of the most revolutionary medical events of the 1960's was the worldwide introduction and use of the Pill. About 8.5 million women in the U.S. use birth control pills. The basic feature of oral contraceptives for women is their ability to act like the hormonal processes which result from pregnancy. They prevent ovulation, the production of eggs by the ovary, which ceases at the onset of pregnancy because of these changes. This same result can be produced by a number of steroids. Some of these are effective when taken by mouth, although how they work, and their long-term effects are not known in detail.

The active ingredients of the Pill are the hormones progesterone and estrogen, or their products.

Do these pills cause cancer? After the first 10 years of usage there was no solid evidence that oral contraceptives cause cancer. Nor was it shown that they cause diabetes, sterility, eye disorders, mental illness, or any of a number of other problems to which they have been linked by critics. Since the latency period for cancer is thought to range from 10 to 20 years, it seems likely that if oral contraceptives do cause cancer, this will be shown during the 1970's.

There is, however, one serious problem that has been linked with the Pill: thromboembolic (blood clotting) disease. These blood clots may be lethal. If they block a major blood vessel in a limb, amputation may be necessary. If they block a vessel to the lungs or brain, death may result. Studies done in Great Britain and the U.S. show that blood clotting is the cause of about 3 deaths per 100,000 users each year. Figures showed that this risk was less than the risk of thromboembolism which would allow for the number of pregnancies that were stopped. But because there is a danger, all women who use the Pill should have checkups at least once every 6 months.

SOURCE: John Netterville, et al, Chemistry, Man, and Society, Philadelphia: W.B. Saunders Company, 1972, 532-3.

WC 322

ALLIED HEALTH LEARNING CENTER

Base Level Reading Passage - Level III

One of the most revolutionary medical developments of the 1960's was the worldwide introduction and use of the Pill. An estimated 8.5 million women in the United States use birth control pills. The basic feature of oral contraceptives for women is their ability to simulate the hormonal processes resulting from pregnancy. By doing this they prevent ovulation. Ovulation, the production of eggs by the ovary, ceases at the onset of pregnancy because of hormonal changes. This same result can be produced by a variety of steroids. Some of these are effective when taken orally, although the mechanism of their action and their long-term effects are not known in detail.

The active ingredients of the Pill are the hormones progesterone and estrogen, or their products.

Do these pills cause cancer? After the first 10 years of usage, there was no conclusive evidence that oral contraceptives cause cancer. Nor was there evidence that they cause diabetes, sterility, eye disorders, mental illness, or any of a number of other diseases to which they have been linked by critics. Since the latency period for cancer is thought to range from 10 to 20 years, it seems probable that if oral contraceptives do cause cancer, this will become evident during the 1970's.

There is, however, one serious disorder that has been linked with the Pill: thromboembolic (blood clotting) disease. Such clots are potentially lethal. If they block a major blood vessel in a limb, amputation may be necessary. If they block a vessel to the lungs or brain, death may result. Studies done in Great Britain and the United States indicate that blood clotting is the cause of about 3 deaths per 100,000 users each year. Statistics indicated that this risk was considerably less than the risk of thromboembolism that would accompany the number of pregnancies which were stopped. However, because there is a danger, all women who use the Pill should have medical checkups at least once every 6 months.

SOURCE: John Netterville, et al, Chemistry, Man, and Society, Philadelphia: W.B. Saunders Company, 1972, 532-3

WC 327

Questions for Base Level Reading Passage

1. This passage was about:

   a) hormonal interaction
   b) constipation
   c) birth control pills
   d) cancer risk and drugs

2. Birth control pills for women:

   a) abort the zygote immediately after fertilization.
   b) block the sperm from entering the fallopian tubes.
   c) deposit a chemical barrier around the egg.
   d) act like the processes resulting from pregnancy.

3. Ovulation is:

   a) the fertilization of the egg.
   b) the production of eggs by the ovary.
   c) the production of pregnancy hormones.
   d) the production of chemicals by the ovary.

4. The one serious disorder that has been linked with the pill is:

   a) cancer
   b) diabetes
   c) mental illness
   d) thromboembolic disease

5. Studies indicate that blood clotting is the cause of about how many deaths per 100,000 Pill users?

   a) 3
   b) 30
   c) 80
   d) 180

6. If the Pill does cause cancer it will be evident during the 1970's because:

   a) 1970 was a bad year.
   b) it takes 10 or 20 years for the disease to develop.
   c) more women are expected to become pregnant in the 1970's.
   d) it takes several years for progesterone to build up.

7. According to the passage, a woman taking the Pill was:

   a) more likely
   b) less likely
   c) just as likely
   d) certain

   to get blood clotting disease as a pregnant woman.

8. Former President Nixon had an embolism in his leg. Dr. feared that:

   a) he might get pregnant.
   b) cancer could result.
   c) the clot could move and block a vessel in his lung.
   d) the clot could dissolve without proper medication.

9. Progesterone and estrogen are:

   a) diseases of pregnant women.
   b) medicines used to treat cancer.
   c) hormones found in the Pill.
   d) serious disorders of the liver.

10. Women who take the Pill:

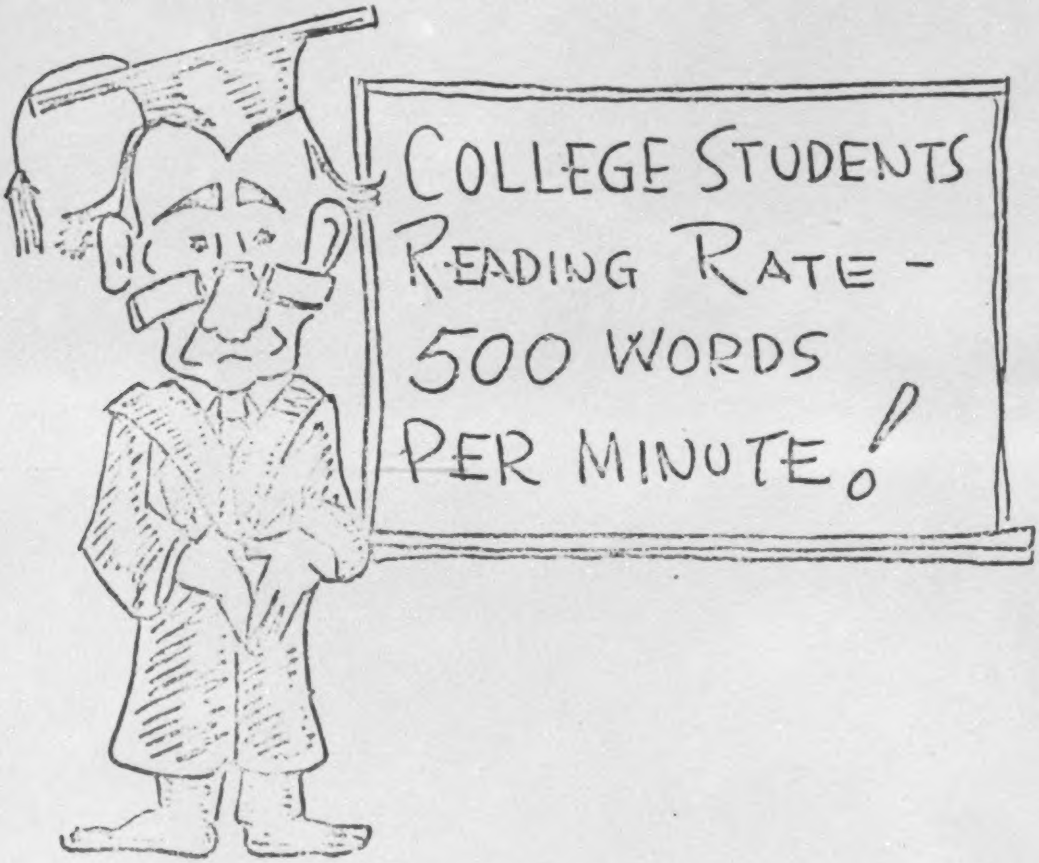
   a) have no need to worry about its effects.
   b) will definitely get thromboembolic disease.
   c) are protected from cancer.
   d) should have a checkup twice a year.

APPENDIX II

FACTS AND MYTHS ABOUT READING RATE

#2 FACT OR MYTH?

"The average college student should read at 500 words per minute."



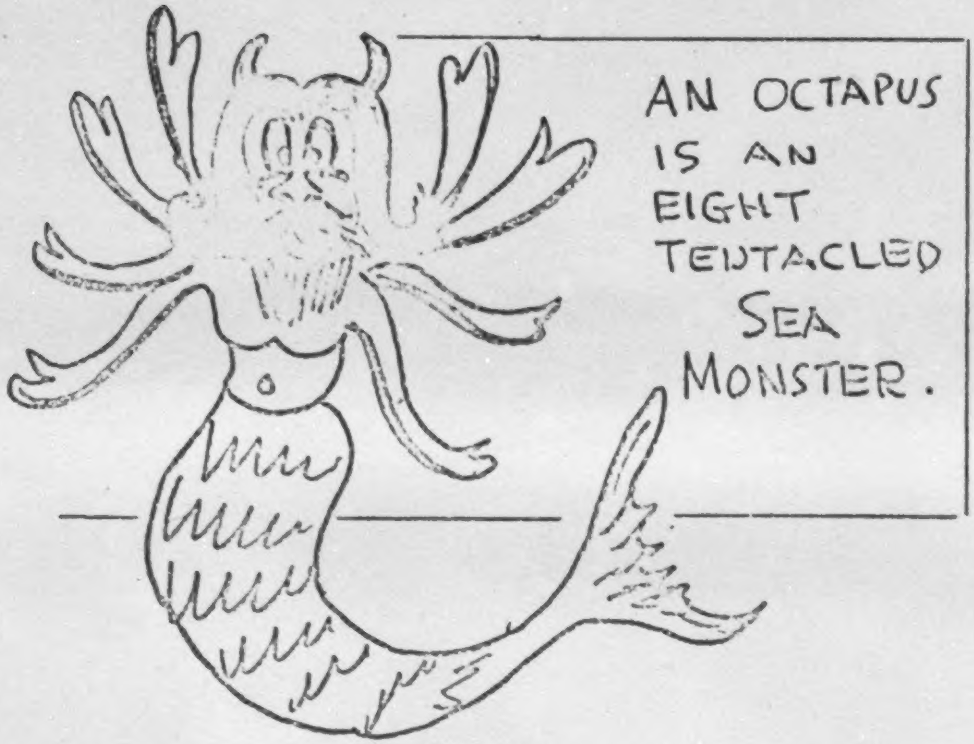
EXPLANATION

For the most part, college students need a flexible reading range to complete a variety of reading activities. An inability to vary reading rates to reflect purpose and content is indicative of the inefficient reader. Therefore, it is a MYTH that, "The average college student should read at 500 words per minute," since reading rate should vary according to specific needs.

FACTS AND MYTHS ABOUT READING RATE

#3 FACT OR MYTH?

"You're a good reader if you can pronounce every word."



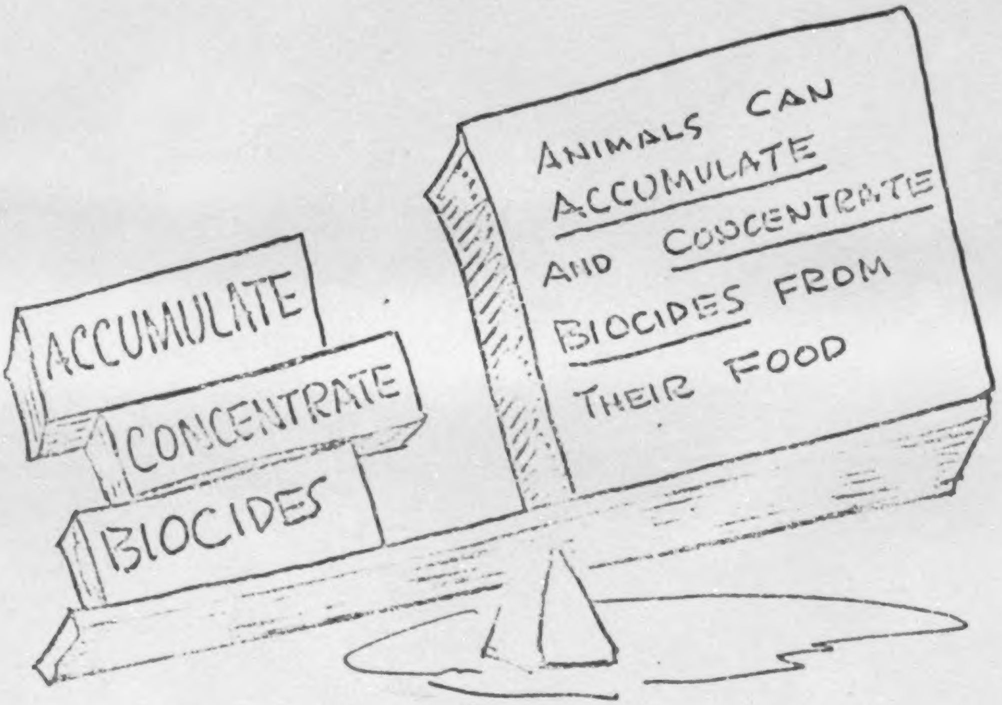
EXPLANATION

Early reading instruction stressed oral reading and correct word recognition. However, it was discovered that it was possible to read aloud and pronounce each word correctly without comprehending the passage. Definitions of words, idiomatic expressions, stated and implied ideas and concepts, are important reading skills which are utilized by the efficient reader. It is a MYTH that, "You're a good reader if you can pronounce every word," because vocalization does not guarantee comprehension.

FACTS AND MYTHS ABOUT READING RATE

#4 FACT OR MYTH?

> "An essential factor for increasing reading rate and comprehension is the development of an adequate sight vocabulary."


ACCUMULATE
CONCENTRATE
BIOCIDES
ANIMALS CAN ACCUMULATE AND CONCENTRATE BIOCIDES FROM THEIR FOOD

EXPLANATION

There is specialized vocabulary related to individual subject areas. These are the building blocks necessary for successful comprehension of written material. Vocabulary may be increased by associating meanings with specific topics and utilizing both contextual and structural analysis clues. It is a FACT that, "An essential factor for increasing reading rate and comprehension is the development of an adequate sight vocabulary."

FACTS AND MYTHS ABOUT READING RATE

#5 FACT OR MYTH?

"To develop maximum reading effectiveness initial diagnosis, appropriate placement and periodic assessment of specific comprehension skills are important."

SCIENCE
ART
HISTORY

EXPLANATION

The goal of the efficient reader is to read as quickly as possible while maintaining an acceptable standard of comprehension. In order to develop maximum reading effectiveness it may be necessary to strengthen several skills. Therefore, questions for each passage in these anthologies have been coded to indicate the comprehension skill being tested. This permits ongoing assessment of comprehension. Therefore, it is a FACT, "To develop maximum reading effectiveness initial diagnosis, appropriate placement and periodic assessment of specific comprehension skills are important."

#6 FACT OR MYTH? (continued)

EXPLANATION

It is essential to acquire basic reading skills before you can effectively increase your reading rate. As you remember, these include:

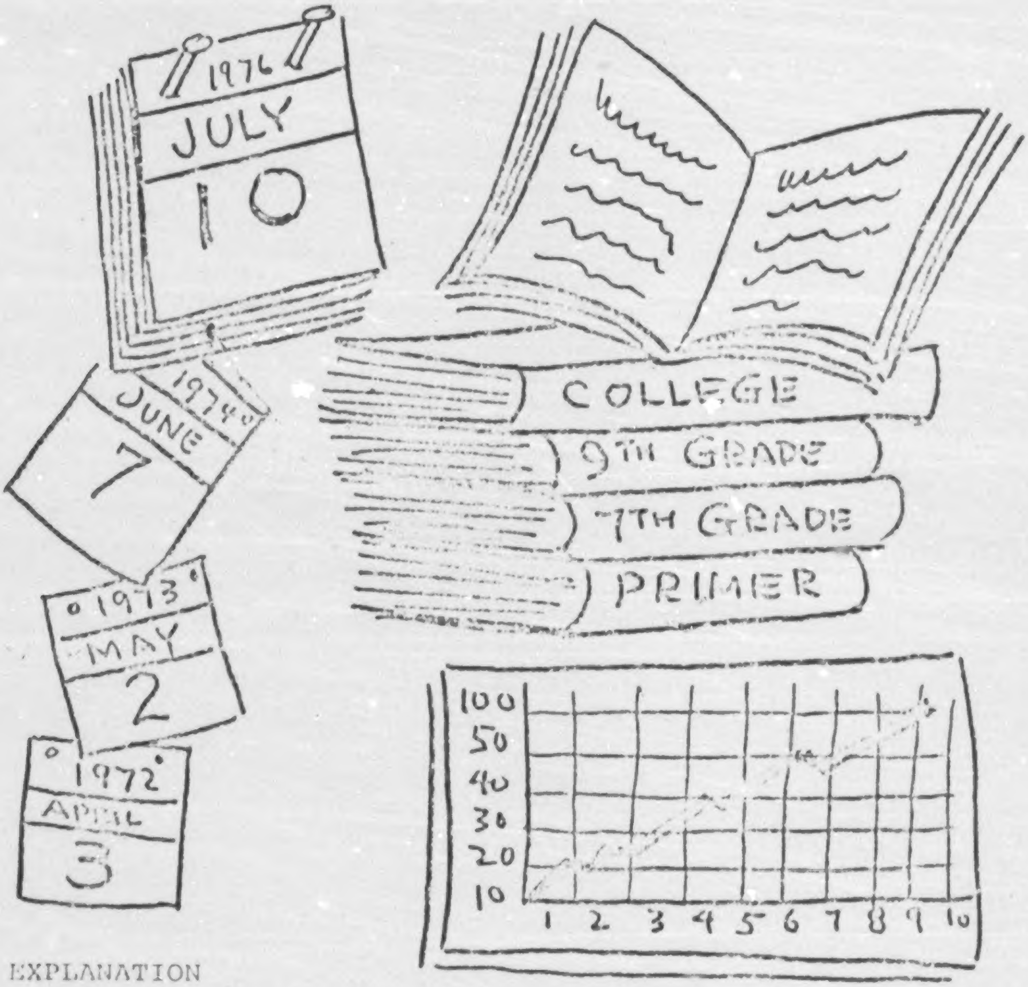
1) Finding the main idea
2) Identifying facts and supporting details
3) Recognizing new vocabulary within the context
4) Drawing inferences and conclusions

In addition, comprehension is increased when fluency in reading is developed, particularly, reading in thought phrases. After completing the practice passages in this book you will continue to develop flexible reading rates with a variety of reading materials. It is a FACT that, "A rapid reading rate with maximum comprehension can only be maintained with continued practice."

FACTS AND MYTHS ABOUT READING RATE

#7 FACT OR MYTH?

"Reading increasingly difficult materials will guarantee a rate increase."


1976
JULY
10
1974
JUNE
7
1973
MAY
2
1972
APRIL
3
COLLEGE
9TH GRADE
7TH GRADE
PRIMER
100
50
40
30
20
10
1 2 3 4 5 6 7 8 9 10

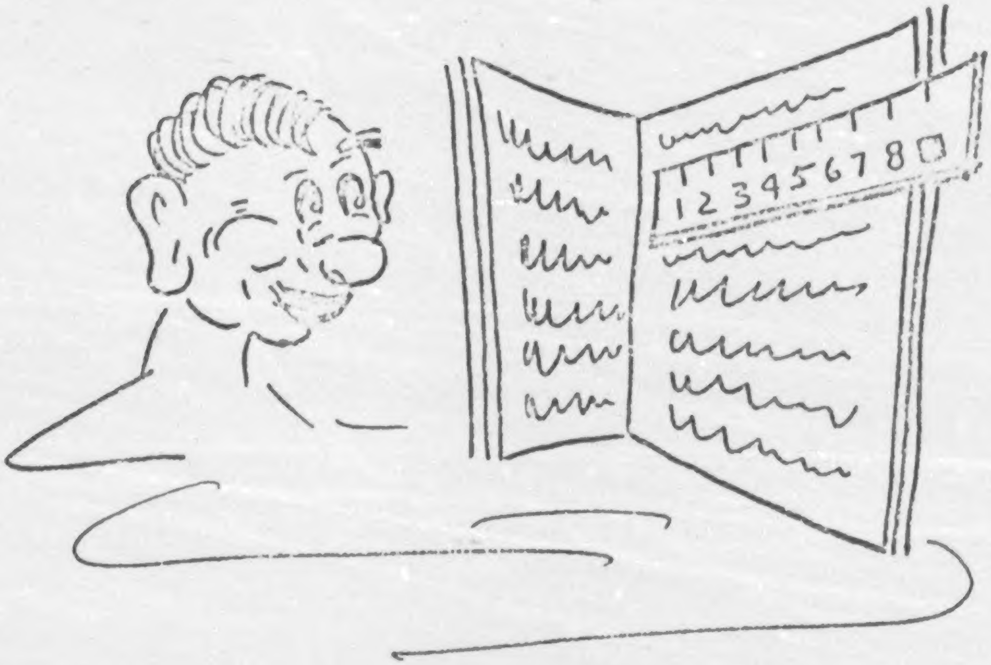
EXPLANATION

Reading progress like any other learning situation, is affected by the development of appropriate skills, attitudes, study habits, and commitment to a program. These factors coupled with properly sequenced materials which are recorded on a progress chart contribute to a most successful learning situation. Reading difficult passages which yield an unacceptable comprehension score should not be a terminal objective. Therefore, it is a MYTH that, "Reading increasingly difficult materials will guarantee a rate increase."

FACTS AND MYTHS ABOUT READING RATE

#8 FACT OR MYTH?

> "Eye exercises can be used to develop an increased eye span of up to 8 inches of reading material."



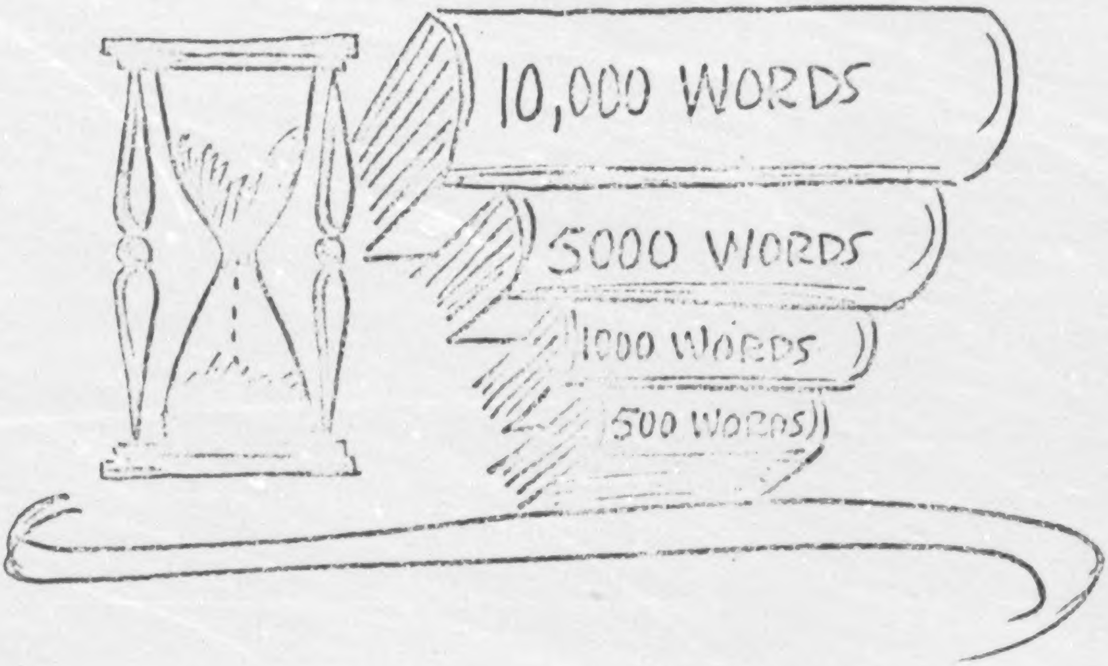
EXPLANATION

Physiologically, it is impossible to increase your eye span to view the entire line of print in a book. However, practice is helpful in training yourself to read in phrases and to minimize eye regression (the habit of re-reading previous phrases). It is a MYTH that, "Eye exercises can be used to develop an increased eye span of up to 8 inches of reading material."

FACTS AND MYTHS ABOUT READING RATE

#9 FACT OR MYTH?

> "You can increase your reading rate to 10,000 words per minute."



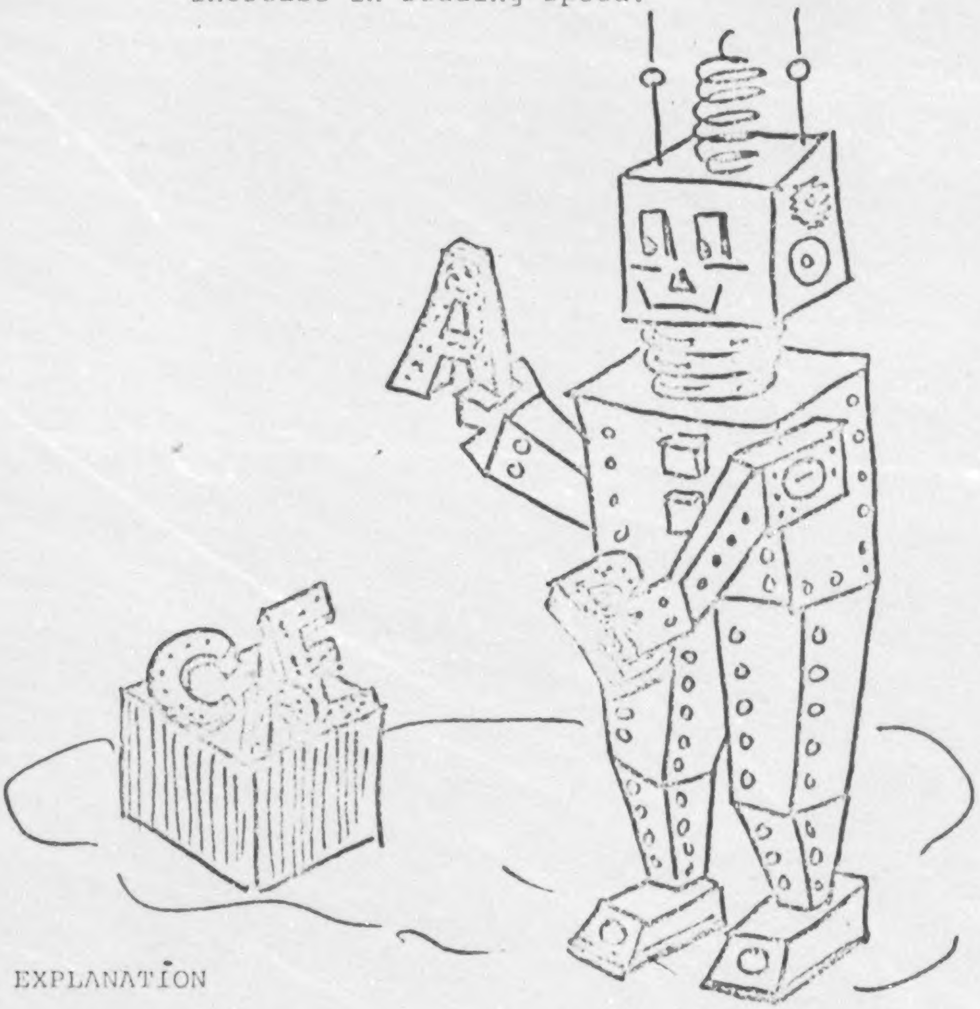
EXPLANATION

For a reading rate to be meaningful, an appropriate comprehension level must be established related to the purpose for reading. Recreational reading may only require 50 - 60% recall in contrast to textbook or study reading which often requires between 70 - 100% recall. It is not possible for the brain to process, in one minute, the information contained in 10,000 words. Therefore, it is a MYTH that, "You can increase your reading rate to 10,000 words per minute."

FACTS AND MYTHS ABOUT READING

#10 FACT OR MYTH?

"Reading machines can result in a tremendous increase in reading speed."



EXPLANATION

Although the machines may serve as motivation, studies indicate that reading improvement gains are obtainable without the use of expensive machinery. Mechanical tools can be useful to establish minimum rates and to test progress. Transitional activities must be provided so that the student is not dependent upon the use of machines for rapid reading. Therefore, it is a MYTH that, "Reading machines can result in a tremendous increase in reading speed," since an increase in reading rate is only meaningful if it can be maintained without any artificial devices.

APPENDIX I

STUDENT DATA SHEET

Professional Learning Skills Course

1. Identification Number of each subject — 1 ☐ 2 ☐ 3 ☐
2. Active/Inactive (A or I) (Active more than 6 passages) — 4 ☐
3. Entry Category Code (1, 2 or 3) (Level I, II, or III) — 5 ☐
4. Culminating Category Code (1, 2, or 3) — 6 ☐
5. Scores
   - a) Pre-Reading Grade Level — 7 ☐ 8 ☐ 9 ☐
   - b) Post-Reading Grade Level — 10 ☐ 11 ☐ 12 ☐
   - c) Pre-Reading Rate — 13 ☐ 14 ☐ 15 ☐
   - d) Post-Reading Rate — 16 ☐ 17 ☐ 18 ☐
   - e) Number Right in Survey Pre — 19 ☐ 20 ☐
   - f) Number Right in Survey Post — 21 ☐ 22 ☐
   - g) Number of passages read — 23 ☐ 24 ☐
6. Major Department (Write letters designating department — 25 ☐ 26 ☐
   - a) Nursing (N.U.)
   - b) Dental Hygiene (D.H.)
   - c) Medical Laboratory (M.L.)
   - d) Radiologic Technology (R.T.)
   - e) Ophthalmic Dispensing (O.D.)

CATEGORY I - ACTIVE

(more than 6 passages)

ID#	HRS	# OF PSGS	READING RATE (WPM)			READING GRADE LEVEL		
			PRE-	POST-	CHANGE	PRE-	POST-	CHANGE
1	8	29	270	380	+110	7.2	11.5	4.3
2	11½	15	220	250	+ 30	8.2	9.6	1.4
3	10	14	200	230	+ 30	9.1	14.1	5.0
4	10	18	125	250	+125	-7	7.0	0
5	10½	16	170	245	+ 75	8.6	12.8	4.2
6	8	16	175	200	+ 25	-7	7.0	0
7	9	17	190	240	+ 50	8.6	7.5	-1.1
8	3	11	220	220	0	8.6	9.6	1.0
9	4½	6	175	175	0	8.2	8.2	0
10	11½	20	190	210	+ 20	7.2	15.0	7.8
11	10	23	180	240	+ 60	7.0	14.4	7.4
12	11	18	160	220	+ 60	7.0	8.7	1.7
13	10	14	115	170	+ 55	9.6	9.3	-0.3
14	11	22	200	280	+ 80	9.6	15.0	5.4

CATEGORY I - INACTIVE
(less than 6 passages)

ID#	HRS	PSGS	READING RATE (WPM) PRE-	POST-	CHANGE	READING GRADE LEVEL PRE-	POST-	CHANGE
15	1	2	130	130	0	7.7	10	2.3
16	4	5	140	175	35	7	8.6	1.6
17	4	3	135	135	0	8.6	10.8	2.2
18	1	2	250	250	0	7.7	7.7	0
19	5	5	210	210	0	7.7	7.2	-0.5
20	2½	3	190	190	0	-7	7.2	0.2
21	8	5	150	150	0	-7	9.1	2.1
22	2½	4	330	370	40	9.6	10.9	1.3
23	0	0	200	200	0	8.6	11.5	2.9
24	0	0	145	150	5	0	7.0	0
25	4	4	135	135	0	8.6	8.2	-0.4
26	5½	6	190	230	40	9.1	8.2	-0.9
27	6	4	170	280	10	-7	6.3	-0.7
28	0	0	135	135	0	-7	6.0	-1.0

CATEGORY II - ACTIVE

ID#	HRS	# OF PSGS	READING RATE (WPM)			READING GRADE		LEVEL
			PRE-	POST-	CHANGE	PRE-	POST-	CHANGE
29	10½	18	240	310	+70	12.8	13.5	.7
30	10	16	200	220	+20	12.0	13.2	1.2
31	10½	17	250	290	+40	10.5	12.2	1.7
32	1½	7	200	200	0	11.0	15.0	4.0
33	10½	15	210	240	+30	12.0	12.4	.4
34*	8	12	160	240	+80	10.9	15.0	4.1
35	4	10	230	270	+40	12.4	14.7	2.3
36	10	18	125	225	+100	10.5	10.0	-.5
37	10	23	200	280	+80	10.9	13.8	2.9
38	10	24	140	200	+60	10.5	14.7	4.2
39	1½	7	150	270	+120	11.4	15.0	3.6
40	10	20	250	340	+90	12.3	14.1	1.8
41	11	19	230	270	+40	10.9	13.2	2.3
42	10	15	190	240	+50	11.4	13.8	2.4
43	10	26	190	275	+85	12.8	14.4	1.6
44	3	9	150	200	+50	12.4	14.7	2.3
45	11	11	215	260	+45	12.0	15.0	3.0
46	8	10	120	240	+120	10.0	10.9	.9
47	11	33	250	300	+50	12.8	12.8	0

CATEGORY II - INACTIVE

ID#	HRS	# OF ISGS	READING RATE (WPM)			READING GRADE LEVEL		
			PRE-	POST-	CHANGE	PRE-	POST-	CHANGE
48	2	5				10.5	11.2	.7
49	1	5	220	220	0	12.0	14.1	2.1
50	1	3	140	150	+10	12.8	15.0	2.2
51	2	5	300	310	+20	10.0	10.4	.4
52	2	5	165	160	-5	11.4	10.8	-.6
53	3½	4	160	120	-40	12.8	10.0	-2.8
54	1	3	200	210	+10	10.5	12.8	2.3
55	3	5	145	150	+5	12.4	13.0	.6
56	0	0	200	200		12.4	15.0	2.6
57		3	300	320	+20	12.8	12.2	-.6
58	1	1	100	100	0	10.9	10.8	-.1
59	1½	6	200	200	0	12.4	14.7	2.3
60	2½	3	210	220	+10	10.0	6.3	-3.7
61	3	9	150	200	+50	12.4	14.7	2.3

CATEGORY III - ACTIVE

ID #	HRS	# OF PSGS	READING RATE (WPM) PRE-	POST-	CHANGE	READING GRADE LEVEL PRE-	POST-	CHANGE
62	10	12	190	190	0	14.0	13.8	-.2
63	11	22	250	370	+120	14.0	15.0	1.0
64	10	21	155	215	+60	14.0	15.0	1.0
65	10	18	200	240	+40	14.0	10.8	-3.2
66	10	7	130	130	0	14.0	13.5	-.5
67	5	7	210	230	+20	14.0	15.0	1.0
68	10	31	220	305	+85	14.0	15.0	1.0
69	10	27	120	280	+160	14.0	15.0	1.0
70	10	21	175	240	+65	14.0	14.7	.7
71	10½	29	230	275	+45	14.0	15.0	1.0
72	10	21	185	245	+60	14.0	15.0	1.0
73	10	25	200	400	+200	14.0	12.2	-1.8
74	10	16	175	225	+50	13.5	7.7	-5.8
75	10	20	270	335	+65	14.0	15.0	1.0
76	9½	35		375		14.0	14.7	.7
77	11½	16	175	245	+70	13.8	15.0	1.2
78	10	18	260	320	+60	14.0	14.7	.7
79	2½	6	205	240	+35	14.0	15.0	1.0
80	4½	9	220	260	+40	14.0	14.7	0
81	11	32	220	285	+65	14.0	14.4	.4
82	10	28	280	315	+35	14.0	15.0	1.0
83	4½	9	160	280	+120	14.0	14.1	.1
84	11	12	250	280	+30	13.8	14.4	.6
85	10	19	225	260	+35	13.3	13.8	.5
86	4	15	250		+160	14.0	15.0	1.0

CATEGORY III - INACTIVE

		# OF	READING RATE	(WPM)		READING GRADE	LEVEL	
ID#	HRS	PSGS	PRE-	POST-	CHANGE	PRE-	POST-	CHANGE
87	1	5				13.3	14.0	0.7
88	1½	4				13.8	14.1	0.3
89	5½	3				13.8	14.4	0.6
90	1	0				14.0	15.7	0.7
91	2	3				14.0	13.8	-.2
92	1½	4	160	130	-30	14.0	14.0	0
93	0	0	210	210		14.0	8.7	-5.3
94	4½	3	200	220	+20	14.0	13.5	-0.5
95	0	0	150	150		14.0	15.0	1.0
96	2	5	240	280	+40	13.8	14.4	0.6
97	5	8	195	300	+105	14.0	15.0	1.0
98	0	0	225	225		14.0	15.0	1.0
99	2	3	270	290	+20	14.0	14.0	0
100	0	0	230	230		14.0	13.8	-.2
101	4	5	285	275	-10	14.0	13.5	-.5

Table 4

Active

Group I	Group II	Group III	
4.3	0.7	-0.2	
1.4	1.2	1.0	
5.0	1.7	1.0	
0	4.0	-3.2	
4.1	0.4	-0.5	
0	4.1	1.0	
-1.1	2.3	1.0	
1.0	-0.5	1.0	
0	2.9	-1.8	
7.8	4.2	-5.8	
7.4	3.6	1.0	
1.7	1.8	0.7	
-0.3	2.3	1.2	
5.4	2.4	0.7	
	1.6	1.0	
	2.3	0	
	3.0	0.4	
	0.9	1.0	
	0	0.1	
		0.6	
		0.5	
		1.0	
$n=14$ $x=36.8$ $x^2=213.04$ $\frac{(x)^2}{n}=\frac{36.8}{14}=96.73$	$n=19$ 38.9 114.3 $\frac{(38.9)^2}{19}=79.64$	$n=25$ 4.4 62.1 .77	$N=58$ $G=80.1$ $x^2=389.44$ $(x)^2=177.14$
(1) $G^2/N=110.62$	(2) $x^2=389.44$	(3) $\frac{(x)^2}{n}=177.14$	

SS treatment = (3)-(1) = 66.52
SS error = (2)-(3) = 212.3
SS total = (2)-(1) = 278.82

SIGNATURE PAGE

I certify that I have read and am willing to sponsor this Major Applied Research Project submitted by LORRAINE BEITLER. In my opinion it conforms to acceptable standards and is fully adequate in scope and quality, as a Major Applied Research Project for the degree of Doctor of Education at Nova University.

B R Herrscher

Barton R. Herrscher, MARP Advisor

I certify that I have read and am willing to sponsor this Major Applied Research Project submitted by LORRAINE BEITLER. In my opinion it conforms to acceptable standards and is fully adequate in scope and quality, as a Major Applied Research Project for the degree of Doctor of Education at Nova University.

Richard R. Alfred, Professional Reader

I certify that I have read and am willing to sponsor this Major Applied Research Project submitted by LORRAINE BEITLER. In my opinion it conforms to acceptable standards and is fully adequate in scope and quality, as a Major Applied Research Project for the degree of Doctor of Education at Nova University.

Ross Moreton, Director of Research &
Evaluation

Curriculum Vitae - Lorraine Beitler

Education	Date Conferred
Ed.D. Candidate - Curriculum Development	1976
M.S. in Education - Learning Disability and Ed. Diagnosis	1974
M.A. in Education - Ed. Guidance and School Counseling	1954
B.A. Chemistry/Education	1948

Experience

Position	Institution	Date
Assoc.Prof.& Coordinator, Allied Health Learning Center	N.Y.C.Community College (NYCCC)	1972-76
Co-Director,Learning Resource Center	"	1971-72
Instructor,Developmental Skills	"	1967-71
Guidance Coordinator	N.Y.C.Bd.of Ed.	1957-58
Science Teacher-Guidance Counselor	"	1950-57

Academic and Professional Participation

President-Int'l. Reading Assoc. S.I.G.-2-Yr.Colleges	1974-76
President-Elect Int'l. Reading Assoc. "	1972-74
Faculty Welfare Trustee - Elected Representative of N.Y.C.C.C. of the City University Pension and Welfare Program	1975-78
Resource Person - "Impact Model: Measuring Effectiveness Through Student Outcomes": Surviving in the Seventies: The Essential Partnership - Institutional Research & College Management, American Assoc. of Community & Jr. Colleges, Washington, D.C.	3/19/76
Chairperson/Workshop Leader - "Accountability for Developmental Education at Community Colleges: Techniques for Measurement," Eastern Regional Conference, International Reading Assoc., Phila.	3/11/76
Consultant - "Learning Laboratory Specialist Workshop", 2-Yr. College Development Center, State University of New York at Albany	11/25/76
Faculty/Consultant - Training Institutes for Faculty of Schools of Allied Health sponsored by American Society of Allied Health Professions, and H.E.W. held at Memphis Tenn., Charleston, S.C., Tuscon, Ariz., Boise, Idaho, Indianapolis, Ind., Greenvale, N.Y.	1974-75

Workshop Leader - "Developing a Systems Approach for Units of Instruction Relating Reading to Course Content", Pre-Convention Institute of International Reading Assoc., Barbizon Plaza	5/12/75
Workshop Leader - "Orientation, Testing, and Remediation", City University of New York, Office of Admissions Services	4/24/75
Presentation - "Use of media to provide alternative strategies for learning for the community college student" Educational Media Producers Council, Eastern Regional Meeting, Bd. of Higher Ed.	3/31/75
Program Coordinator - "Instrument for a Comprehensive and Relevant Education" workshop, Dept. of Health, Education and Welfare, Public Health Service, at Graduate Center of City University of New York, Josue E. Diaz, chief, Health Manpower Branch	11/30/75
Presentation - "Supportive Strategies for the 'Now' Faculty and Student in the Allied Health Professions," National League for Nursing, N.Y. Sheraton Hotel, Dean A. Tuosto, Assoc. Dean of Faculty, N.Y.C.C.C.	12/16/74
Workshop Leader - "Reading and the Sciences" Fourth Annual Conference of the City University of New York, Commodore Hotel	10/7/74
Key-Note Speaker - Plenary Session of Great Lakes Regional Council of the International Reading Association, Special-Interest Group- 2-yr. colleges, Toledo, Ohio	10/4/74
Planning Committee - "National Developmental Education Conference," Council for Higher Education in Newark, Washington, D.C.	9/26/74
Chairperson of Planning Committee - Allied Health Symposium, New York City Community College, 186 Jay Street, Brooklyn, New York	5/31/74
Guest Speaker - "Curriculum Modifications in Urban Education," Fordham University Graduate School of Education	1/23/74
Planning Committee/Workshop Leader - "Reading in the content areas: Natural Sciences," Third Annual Conference of the City University of New York	11 / 7 / 4

"In-Service Training for Faculty in Reading Improvement Divisions and Natural Sciences," Third Annual Conference of the City University of New York	11/ 7/74
Symposium - "The Colleges' Commitment to Attainment of National Goals," College Reading Association, Leslie Berger, Assoc. Dean of Academic Planning for CUNY	11/ 2/73
Panelist - "New Approaches to Student Development in Two-Year Colleges," Junior College Council Middle Atlantic States	10/19/73
Co-Chairperson and Panelist - "Meeting the Reading Needs of Students in Two-Year Colleges." Pre-Convention Institute, International Reading Assoc., Denver	5/1/73
Program Chairperson - Planned and Coordinated Programs. "Two-Year College Special Interest Group," International Reading Assoc.	5/1/73
Consultant - Professor Alexander Vazauez, Voorhees Campus, Continuing Education - Certificate Program in Machine Tool Technology. "Machine Tool Reading Comprehension Preliminary Course Outline "	1973
Participant - New Alliances for Brooklyn, YWCA at request of Arthur Chase, Ass't. to the President and consultant on Urban Affairs	3/23/73
Panelist - College Reading Assoc., "Models of Remediation for Open Admission Students." James McGrath, Dean of Academic Affairs at CUNY	11/72
Resource Person - 17th Convention of the International Reading Assoc., "Directors of Junior College Reading Centers." Detroit, Mich., (Registration limited to 35)	5/12/72
Workshop Leader - "Learning Resources for Career Programs." International Reading Assoc., Detroit, Mich.	5/10/72
Chairperson of Seminar - "A Reading Laboratory for College Students," College Reading Assoc., Silver Springs, Maryland,, Prof. Dorothy McGinnis, panelist	3/24/72

Conference - Yair Levin, Director, Ministry of Education, Jerusalem, Israel. 8/71

Conference - Stephen Jemric, Professor of English at the University of Zabreb, Yugoslavia 7/19/71

Conference Participant - "Career Teachers Conference," University of Nottingham, England, Conference with her Majesty, Inspector to the State Schools, G.S.U.Petter 7/ 6/71

Program Presentation - "Content-Oriented Skills Instruction for Community College Students," at a seminar for Directors of Reading Program at the International Reading Assoc., Atlantic City, New Jersey 4/22/71

Publications

Editorial Board - Reading Horizons, Western Michigan University 1974-77

"Innovative Learning Alternatives in the Community College - International Reading Association, SIG, 2-Year Colleges 1975-76

Co-Author - "Facilitating the Learning & Teaching Process Through an Allied Health Learning Center" ERIC Presentation at the American Assoc. of Community and Jr. Colleges, Seattle, Wash. 4/16/75

Co-Author - "Tutoring - A Guide For Maximum Effectiveness" 1975

Author - "Expanded Responsibilities of the Reading Specialist", Forum for Reading, Vol. 4, No. 2 1975

Committee Member - "Non-Print Media Awards Committee, International Reading Assoc. 1975-76

Reviewer - Prentice Hall Publishing Co., Houghton Mifflin Publishing Co., International Reading Assoc. 1974-76

Author - "Staff Dynamics for Planned Innovation in a Learning Center," Forum For Reading, page 45. 4/74

Editorial Staff - Newsletter - Women's Committee for Professional Concerns 1973

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CLEARINGHOUSE FOR
JUNIOR COLLEGES

Co-Editor - Forum For Reading, implemented the initial official publication of International Reading Association Special Interest Group for Two-Year College Programs
1971-1972, Volume I, Editions 1, 2, and 3
1972-1973, Volume II, Editions 1, 2, and 3 — 1972-73

Reviewer - Review of "Proceedings of the Fourth Annual Conference of the Western College Reading Association, Volume IV; Interdisciplinary Aspects of Reading Instruction," Journal of Reading, page 106 — 5/1972

Co-Author - "The Design and Implementation of a Learning Center for Career-Oriented Students," 21st Annual Yearbook of the National Reading Conference, ERIC Community Colleges — 1972

"Tutorial Assistance in College Programs" 22nd Annual Yearbook of the National Reading Conference, page 19. Programs and Practices for College Reading, Volume II — 1973

"International Developments in Reading-Conference with Yves de Farge, Regional Administrator of the Academy in Paris, Consultant for Education in the Technologies; Forum For Reading, Volume II #2 — 1972

Ad Hoc Committee (Newsletter) - City University of New York for Inter-Intra Communication among Faculty of City University of New York Students — 1972

Paper Presentation - "The Design and Implementation of a Learning Center for Career-Oriented Students," National Reading Conference, Tampa, Florida, published in the 21st Annual Year-book — 1971

Co-Author - "International Developments in Reading-Career Teachers Conference, University of Nottingham, England, Forum For Reading,, Volume I, #1 — 1971

Membership in Professional Societies (Last five years only.)

International Reading Association
College Reading Association
American Association of University Professors
National Education Association
American Society of Allied Health Professions